INITIAL DEVELOPMENT OPERATIONS COORDINATION DOCUMENT

ATWATER VALLEY BLOCKS 305 AND 349
OCS-G 18556 AND 18577

JUBILEE PROSPECT

OFFSHORE, ALABAMA

Anadarko Petroleum Corporation
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The Woodlands, Texas 77380
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ANADARKO PETROLEUM CORPORATION
DEVELOPMENT OPERATIONS COORDINATION DOCUMENT
LEASES OCS-G 18556 and 18577
ATWATER VALLEY AREA, BLOCKS 305 AND 349

APPENDIX A	Contents of Plan
APPENDIX B	General Information
APPENDIX C	Geological, Geophysical & H2S Information
APPENDIX D	Biological Information
APPENDIX E	Wastes and Discharge Information
APPENDIX F	Oil Spill Response and Chemical Information
APPENDIX G	Air Emissions Information
APPENDIX H	Environmental Impact Analysis (EIA)
APPENDIX I	CZM Consistency Certification Format
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APPENDIX A
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DESCRIPTION/OBJECTIVE/SCHEDULE

Leases OCS-G 18556 and 18577 were acquired by Anadarko Petroleum Corporation, at Lease Sale No. 166. The subject leases were issued with an effective date of August 1, 1997 and primary term ending date of July 31, 2007. Anadarko is the designated operator of the subject oil and gas leases and the designated applicant under Oil Spill Financial Responsibility regulations.

An Initial Exploration Plan (Control Number N-7545) to drill and complete a total of ten wells (five each in Blocks 305 and 349) was approved in October, 2002. Subsequent Revised Exploration Plans, Control Numbers R-3948, R-4125, R-4148 and R-4149, were approved September 10, 2003, February 18, 2005, April 22, 2005 and May 2, 2005 respectively. Atwater Valley Block 349 Wells No. 1 and 2 were drilled and temporarily abandoned in the second and third quarters of 2003. Atwater Valley Block 305 Well No. 1 and Atwater Valley Block 349 Well No 3 were spud in February, 2005 and are currently drilling shut-in.

A Conceptual DWOP was submitted to MMS January 13, 2005. A Preliminary DWOP is being prepared for submittal to MMS. A Conservation Information Document was submitted to MMS in November, 2004 and is pending approval.

Under this DOCD Anadarko proposes to place Atwater Valley Block 349 Well No. 2 and 3 and proposed Atwater Valley Block 349 Well No. 4, and Atwater Valley Block 305 Well No. 1 and proposed Well No. 2 on production from target sands as outlined in Appendix C. The Atwater Valley Block 349 Well No. 2 will be completed under the Initial Exploration Plan. The Atwater Valley Block 349 Wells No. 3 and 4, and Atwater Valley Block 305 Well No. 1 and 2 will be drilled and completed under the Initial Exploration Plan. A Revised Exploration Plan for Atwater Valley Block 305 Well No. 2 (Location B Control Number N-7545) and a Revised Exploration Plan for Atwater Valley Block 349 Well No. 4 (Location C Control Number N-7545) were approved to revise these well locations.

Right-of-Way pipelines with associated umbilicals will be installed to transport production from Atwater Valley Block 349 and Atwater Valley Block 305 to Anadarko's proposed Independence Hub in Mississippi Canyon Block 920. In addition, lease term pipelines (jumpers) in Atwater Valley Block 349 and Atwater Valley Block 305 will be installed to transport production from the wells to the right-of-way pipelines.

The following general schedule details the proposed development operations outlined in this plan:

Activity	Estimated Start Date	Estimated Completion Date
Install lease term pipelines and Independence Hub in Mississippi Canyon Block 920	04-01-06	12-31-06
Hook-up and commence production	07-01-07	06-30-2022

Dates shown are tentative and some activities overlap other activities. This schedule defines only those activities that will occur within the Mississippi Canyon Block 920, Atwater Valley Block 305 and Atwater Valley Block 349 development area.

LOCATION

Atwater Valley Blocks 305 and 349 are approximately 110 miles southeast of the Mississippi River Delta off the coast of Louisiana and approximately 180 miles south of Mobile Bay off the coast of Alabama. Atwater Valley Blocks 305 and 349 are located within the Eglin Water Test Area 3 (EWTA-3). There are no fairway or anchorage areas associated with the blocks, and these locations do not encompass any topographic feature, live bottom/ pinnacle trend, artificial reef or State 8(g) area and are not within 200 Km of Breton National Wildlife Refuge.

Mississippi Canyon Block 920 is approximately 90 miles southeast of the Louisiana coastline and 150 miles south of the coast of Alabama. There are no fairway or anchorage areas associated with the block.

Well location plats and bathymetry maps for Atwater Valley Blocks 305 and 349 and Mississippi Canyon Block 920 are enclosed as **Attachment A-1.** Well and facility information is included on Form MMS-137 in Appendix J. The above schedule projects activities in the future; well completion and pipeline/facility installation may occur sooner or later than shown. Wells may not be completed in the order they were drilled and wells may not begin production in the same order completed.

PRODUCTION FACILITIES

Production from Atwater Valley Blocks 305 and 349 will be transported to Anadarko's proposed Independence Hub in Mississippi Canyon Block 920. The Independence Hub is a column-based semi-submersible type hull structure that will process production from deepwater subsea tie-ins. The structure will be affixed to the seafloor in Mississippi Canyon Block 920 and will accommodate up to 16 right-of-way pipelines from subsea wells, and a 20-inch export pipeline. Initially, there will be six subsea tie-backs and one export gas pipeline. The structure will have a two-level deck with an 850 MMSCFD gas processing topsides facility.

The platform has an operating draft of 105 feet; displacement of 50,000 tons; and will include 12 polyester mooring lines, connecting to the unit's 12 suction pilings. Approximately 800' of each mooring line will rest on the seafloor. The mooring system will be designed with the capability to hold the facility on location in 100-year hurricane or 100-year loop current conditions while meeting code strength requirements.

All mooring system components will be designed for an operating life of 20 years. Design life calculations shall include consideration of corrosion and fatigue.

The Independence Hub facilities are designed for an operating life of 20 years. The structure will be classed by the American Bureau of Shipping (ABS) as an A1 Floating Offshore Installation (FOI).

Enterprise Field Services, LLC will install a 20-inch natural gas and condensate right-of-way pipeline which will depart Independence Hub and travel approximately 140 miles to a termination point at a proposed West Delta Block 68 platform. Production from the various fields' subsea tiebacks will be transported to Independence Hub via 10" and 8" natural gas and condensate right-of-way pipelines with associated umbilicals.

The facilities will be designed, installed and operated in accordance with current regulations, engineering documents incorporated by reference, and industry practice in order to ensure protection of personnel, environment and the facilities. When necessary, maintenance or repairs that are necessary to prevent pollution of offshore waters shall be undertaken immediately.

The pollution prevention measures for the Independence Hub Facility include installation of curbs, gutters, drip pans, and drains on deck areas to collect all contaminants and debris.

The facility is gas production only, with some associated condensate. The produced water will be separated from the condensate as an aqueous phase combined with monoethylene glycol (MEG). The MEG will be purified in a proprietary reclaiming system, with the result being pure produced water being discharged overboard. The produced water being discharged overboard will meet the overboard testing requirements for oil and grease toxicity.

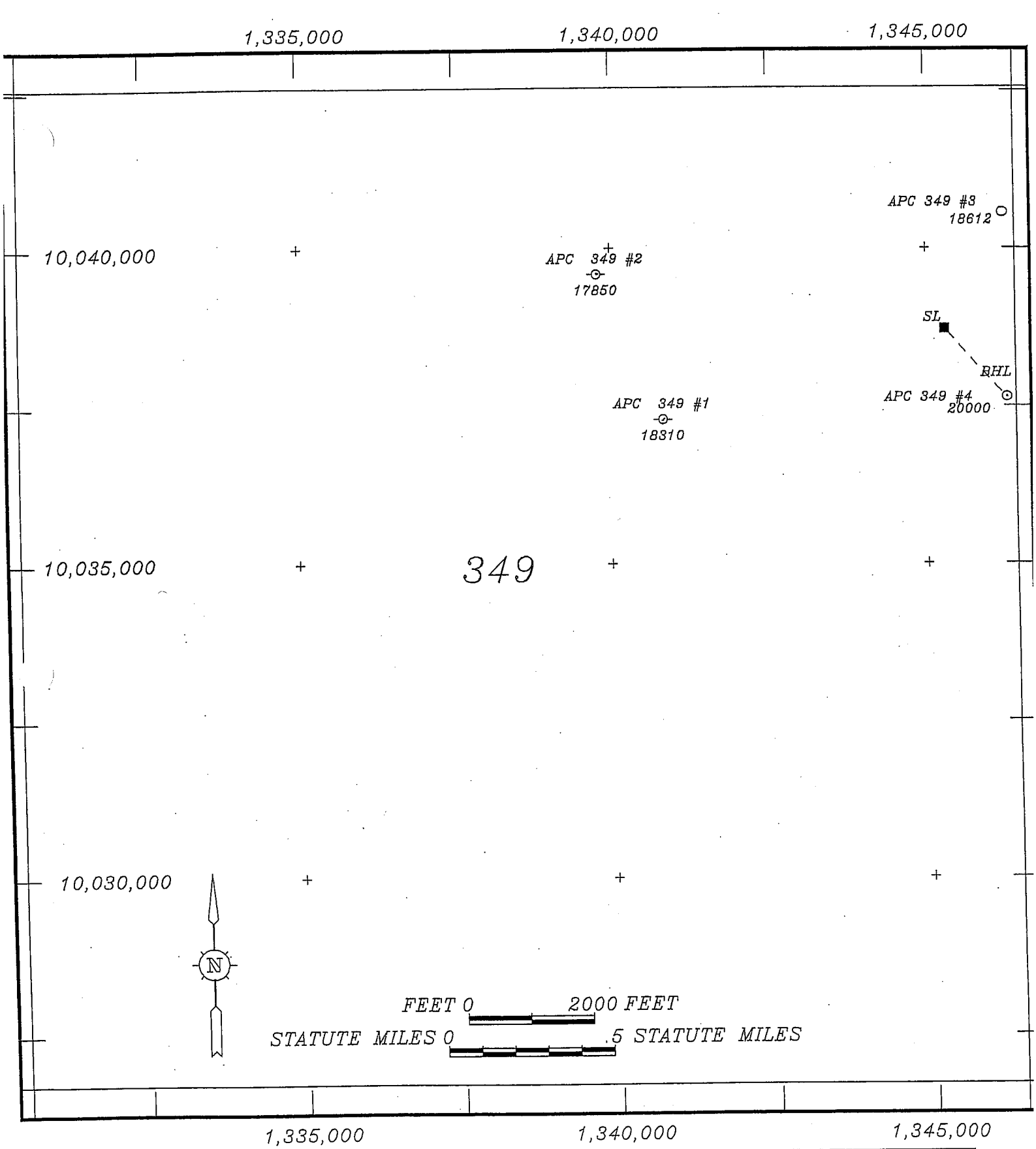
The facility is not set up for zero discharge. For example, the deck drains are routed to two open drain sump piles for removal of hydrocarbons. The facility has a Shipboard Oil Pollution Emergency Plan (SOPEP) which is reviewed and approved annually by the American Bureau of Shipping. The facility will carry sufficient materials to deal with a one barrel oil spill.

Supervisory and certain designated personnel on-board the facility are to be familiar with the effluent limitations and guidelines for overboard discharges into the receiving waters as outlined in the NPDES General Permit GMG290000.

Production safety equipment was designed, and is installed, used, maintained, and tested in a manner to assure the safety and protection of the human, marine, and coastal environments in accordance with 30 CFR 250 Subpart H. Anadarko will perform all installation and production operations in a safe and workmanlike manner, and will maintain all equipment in a safe condition, thereby ensuring the protection of lease and associated facilities, the health and safety of all persons, and the preservation and conservation of property and the environment. The appropriate life rafts, life jackets, ring buoys, etc., as prescribed by the U.S. Coast Guard, will be maintained on the facility at all times.

Any platform production facilities shall be protected with a basic and ancillary surface system designed, analyzed, installed, tested, and maintained in operating condition in accordance with the provisions of API RP 14C, Recommended Practice for Analysis, Design, Installation and Testing of Basic Surface Safety Systems for Offshore Production Platforms.

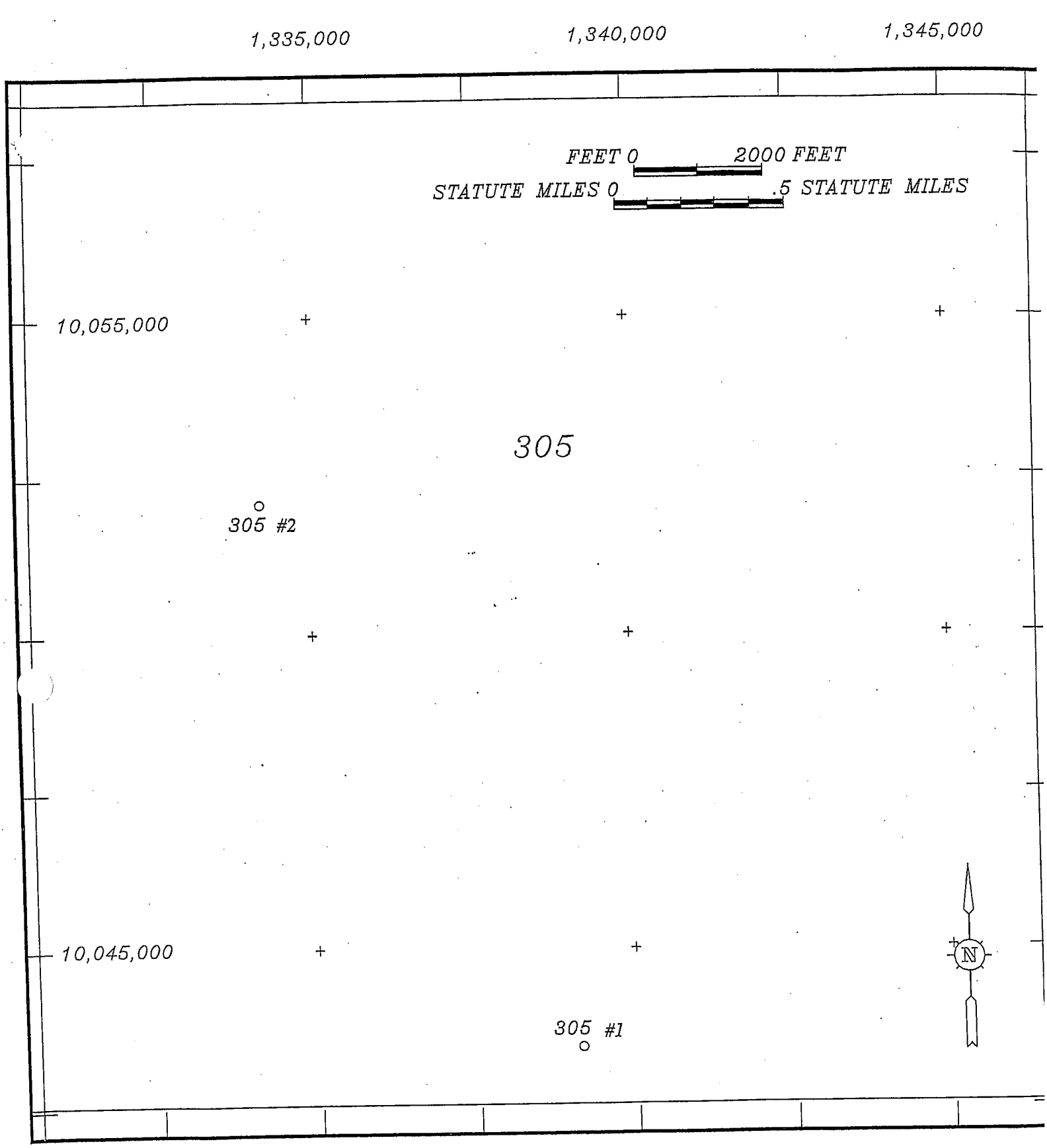
The Independence Hub is a manned structure, and will be identified and reported in accordance with the requirements of the U.S. Coast Guard and MMS.



Well	Loc.	Lease Calls		X	Y	N. Lat.	W. Long.	Water Depth
349-2	SHL	6,575' FEL	2,968' FNL	1,339,824	10,039,592	27.663244	-87.928924	8,748'
349-3	SHL	1,998' FNL	173' FEL	1,346,227	10,040,562	27.666044	-87.909164	8,814'
349-4	SHL	3,844' FNL	1,101' FEL	1,345,300	10,038,716	27.660947	-87.911989	8,854'

Anadarko Petroleum
EGOM

AT 349
Confidential Location Map

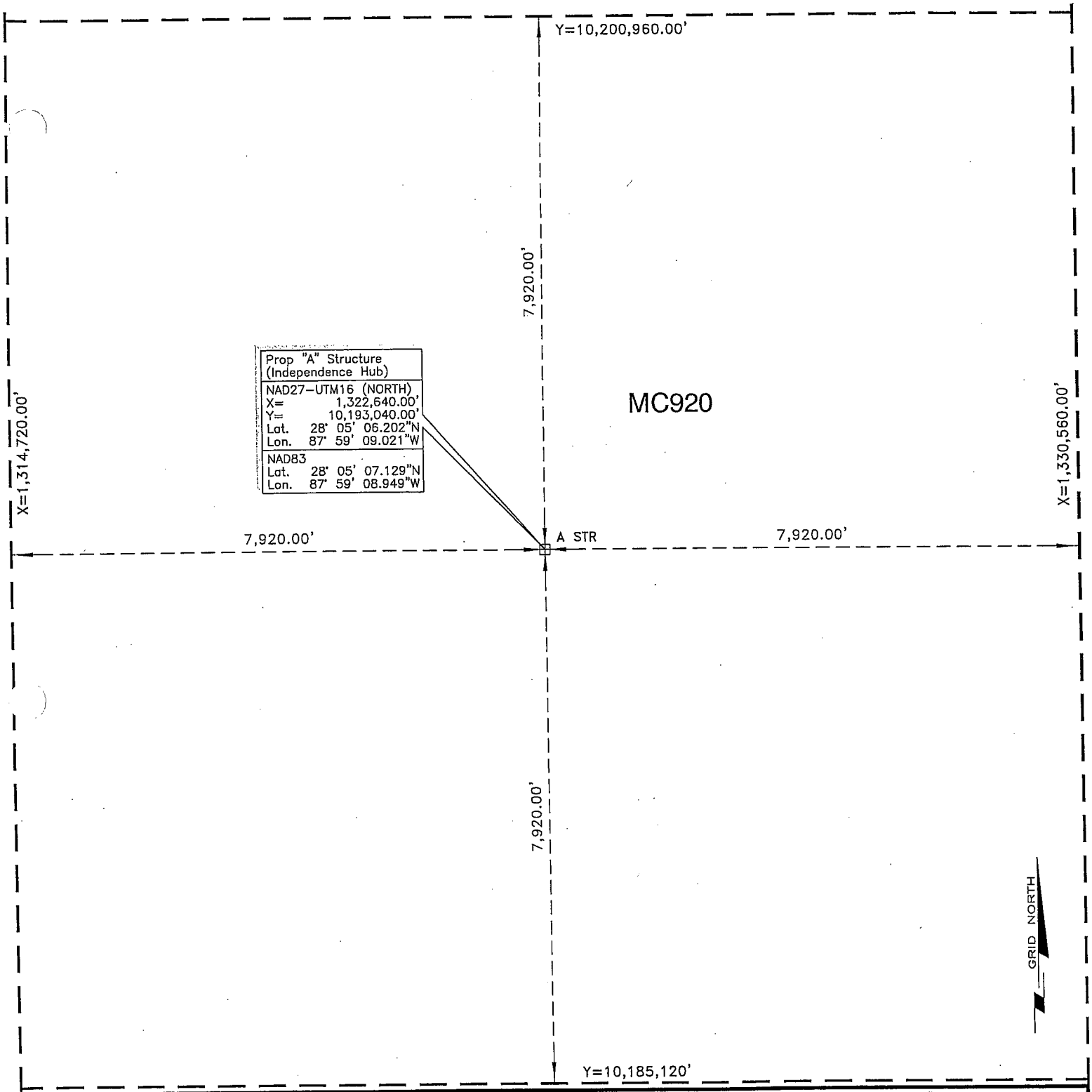


Well	Loc.	Lease Calls		X	Y	N. Lat.	W. Long.	Water Depth
305-1	SHL	890' FSL	7,268' FEL	1339130	10043450	27.673845	87.931160	8637'
305-2	SHL	6,323' FNL	3,647' FWL	1334207	10052077	27.697478	87.946578	8439'

Anadarko Petroleum
Atwater Valley Area

AT 305
Public Location Base Map

6-APR-2005



I HEREBY CERTIFY THAT THE ABOVE PROPOSED STRUCTURE POSITION IS CORRECT.

STATE OF LOUISIANA
STEPHEN R. HENRY
REG. No. 4903
REGISTERED
PROFESSIONAL
LAND SURVEYOR

REG. PROFESSIONAL LAND SURVEYOR NO. 4903
STATE OF LOUISIANA

PUBLIC INFORMATION

Printed: 1/28/05

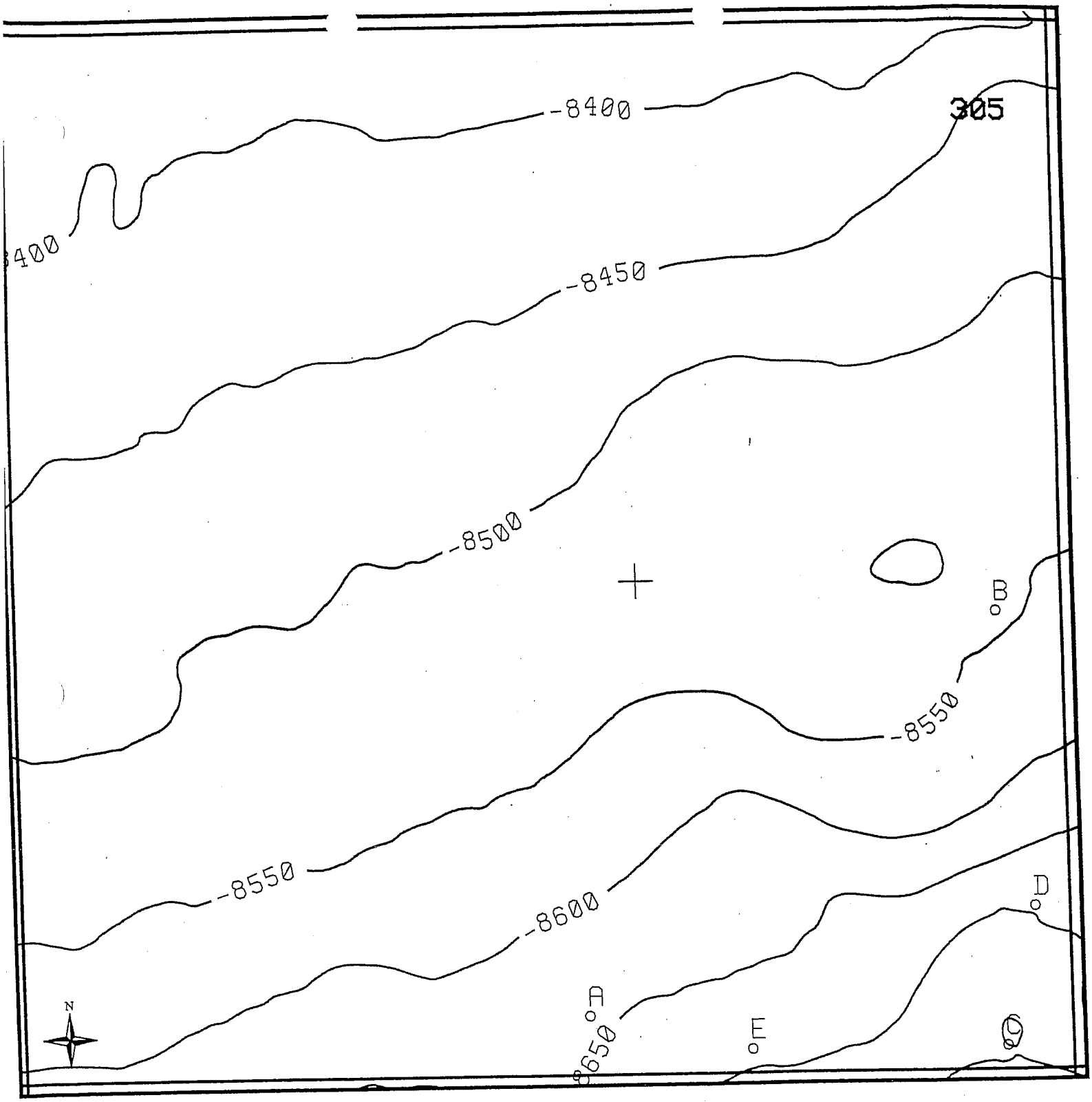
Anadarko Petroleum Corporation

PROPOSED LOCATION
"A" STRUCTURE (INDEPENDENCE HUB)

BLOCK 920
MISSISSIPPI CANYON AREA
GULF OF MEXICO

FUGRO CHANCE INC.
200 Dulles Dr. Lafayette, Louisiana 70506-3001 (337) 237-1300

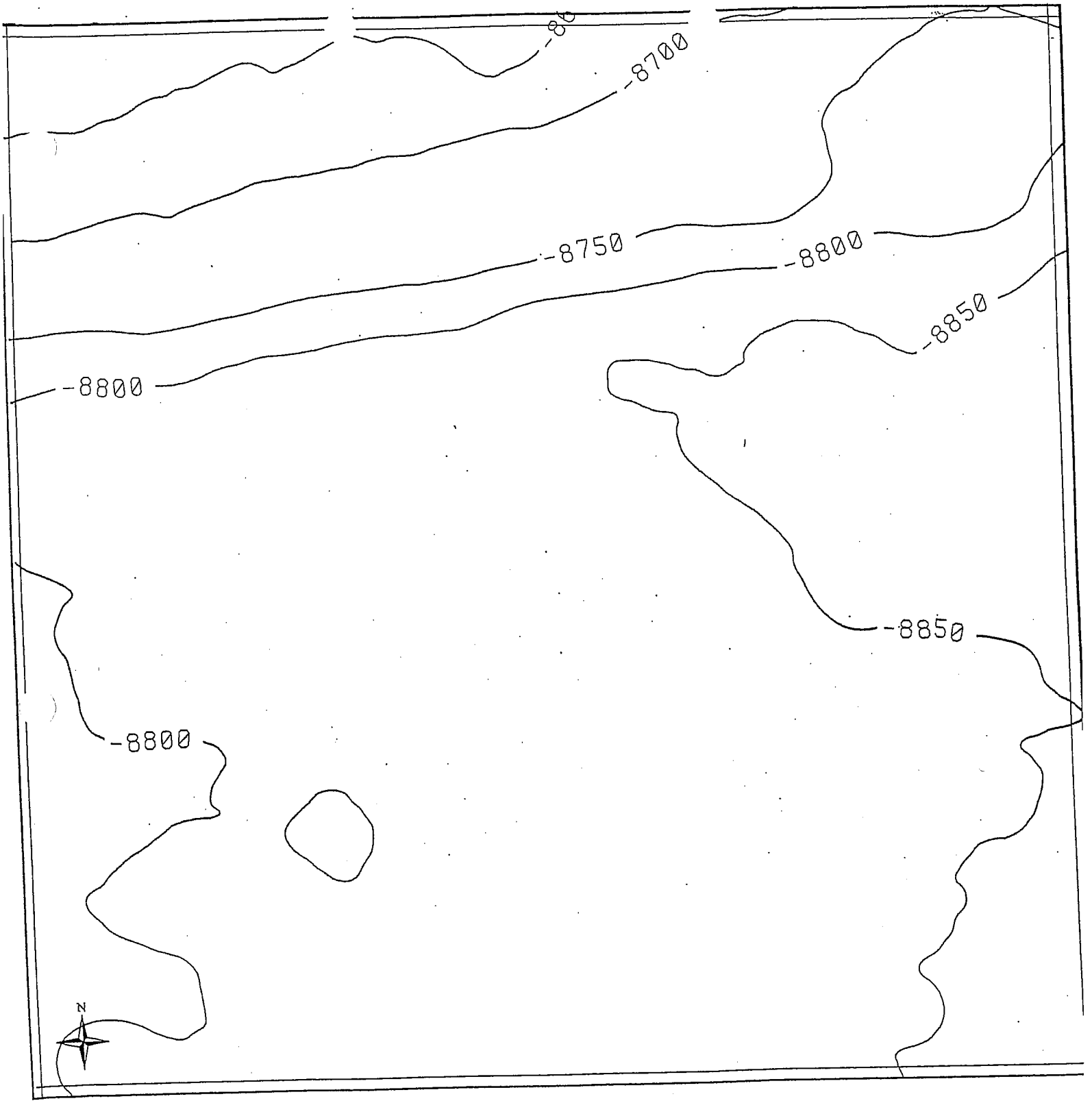
GEODETIC DATUM: NAD27 PROJECTION: U.T.M. 16 (NORTH) GRID UNITS: US SURVEY FEET		SCALE IN FEET 0 2,000'	
Job No.: 05-0448	Date: 1/28/05	Drwn: VAG	Chart: 1 Of: 1
Dwgfile: O:\WellPermit\UTM16\MC\Permit\920PASTR			



Anadarko
PETROLEUM CORPORATION

AT 305
OCS-G-18556
Bathymetry Map

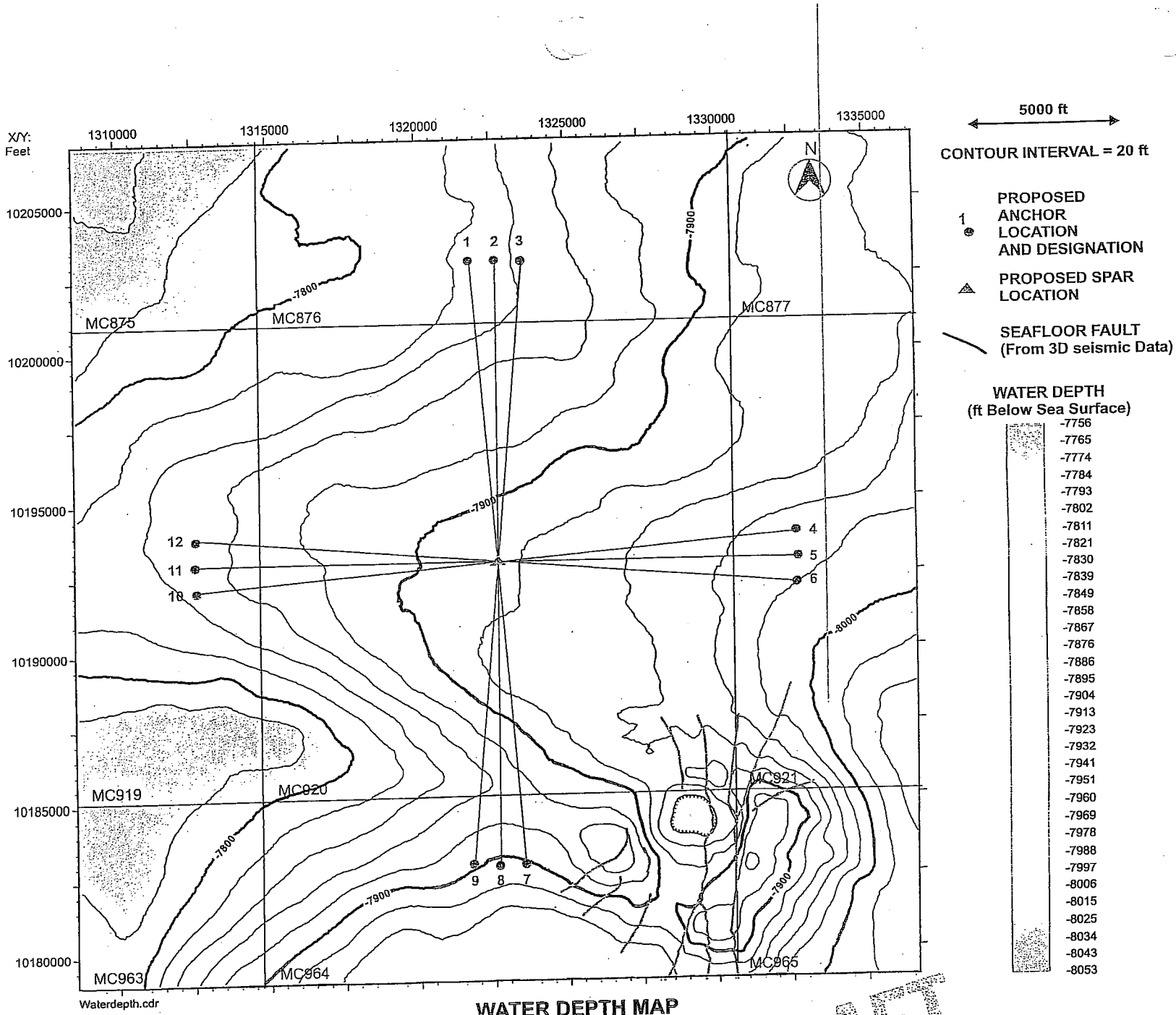
Scale: 1"=2,000' By: SLH : Date: 29/JUL/02



Anadarko
PETROLEUM CORPORATION

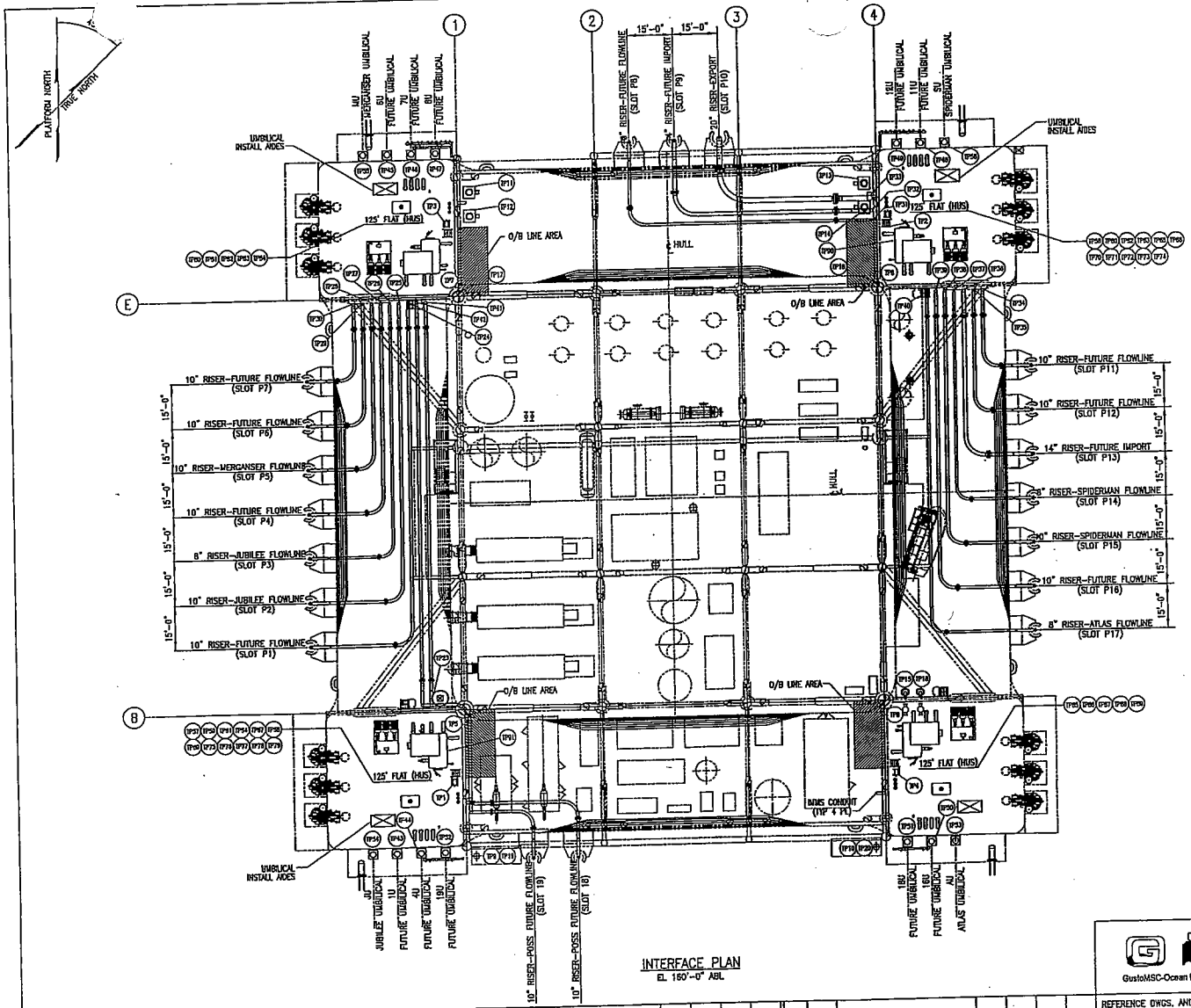
AT 349
OCS-G-18577
Bathymetry Map

Scale: 1"=2,000'	By: SLH	Date: 29/JUL/02



WATER DEPTH MAP
(Based on 3D Seismic Data)

DRAFT



INTERFACE PLAN
EL 150'-0" ABL

IN PROGRESS
8/31/04

GustoMSC-Ocean Design Houston, Texas

Atlantia Offshore Limited
ATLANTIA MEMBER OF THE MC CALMS GROUP

GulfTerra

ATWATER VALLEY HUB FACILITY

SEMI-SUBMERSIBLE FPU

HULL
GENERAL ARRANGEMENT
COLUMN TOP INTERFACE

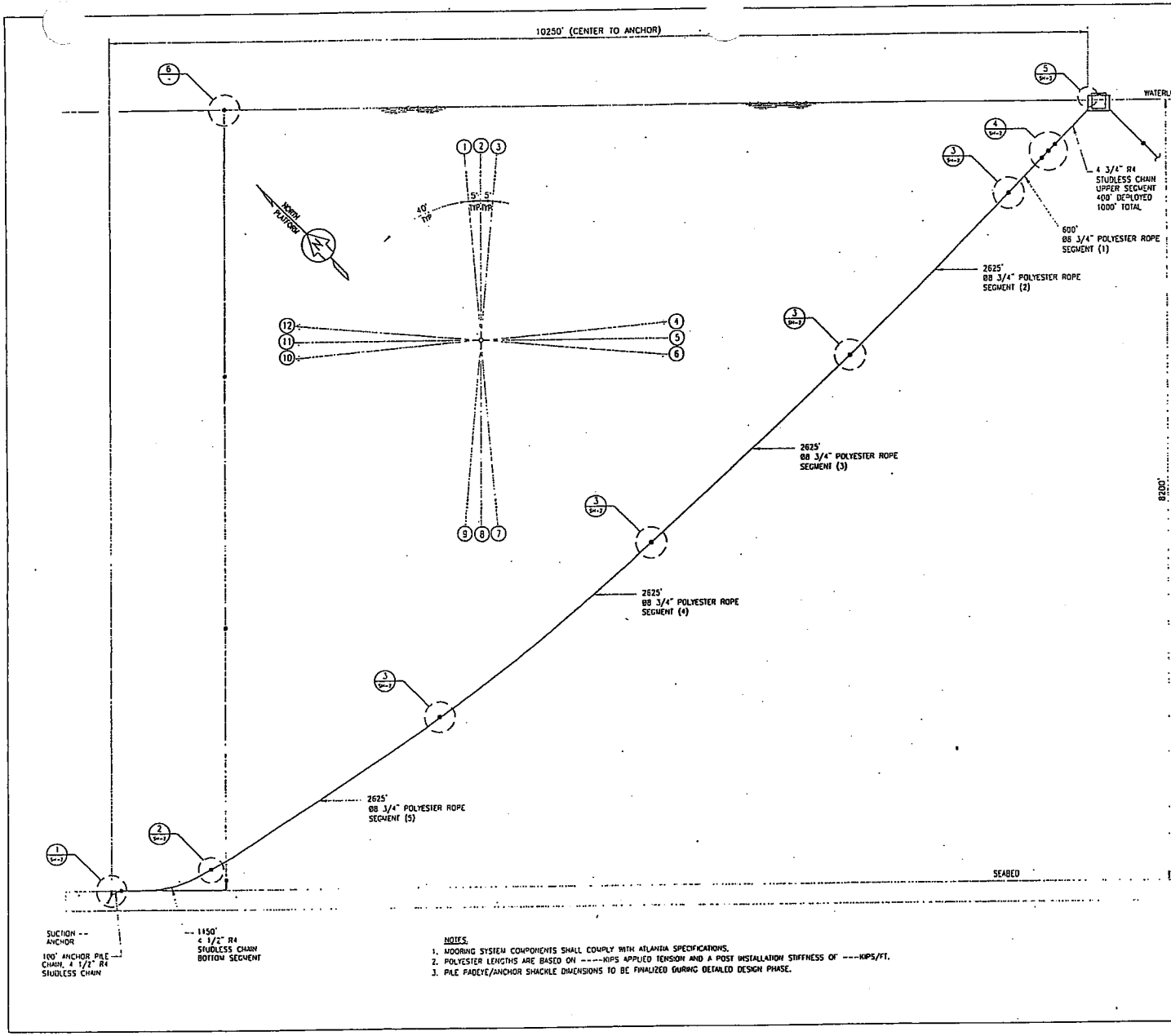
NOTES:

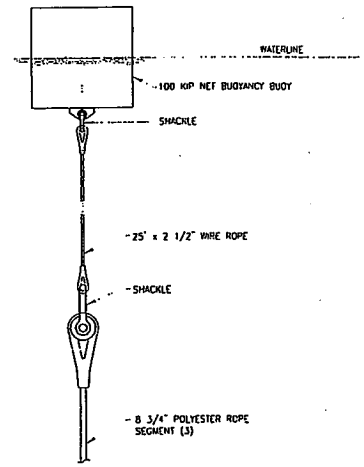
REFERENCE DWGS. AND REVISION NOTES:

REV.	ISSUED DATE	REASON FOR ISSUE	DRAWN BY	DRAFT. CHK'D	APPR. 1	APPR. 2
P1	8/31/04	PRELIMINARY REVIEW	JLR		DEB	RJB

REV.	ISSUED DATE	REASON FOR ISSUE	DRAWN BY	DRAFT. CHK'D	APPR. 1	APPR. 2

REF. NO.
PROJECT NO. AO 73304
DRAWING NO. DVH7570
SCALE: 1/64" = 1'-0"
FORMAT: D
REV. P1





DETAIL
R.T.S.

NOTES:
1. MOORING SYSTEM COMPONENTS SHALL COMPLY WITH ATLANTIA SPECIFICATIONS.
2. POLYESTER LENGTHS ARE BASED ON ----KIPS APPLIED TENSION AND A POST INSTALLATION STIFFNESS OF ---KIPS/FT.
3. PILE PADEYE/ANCHOR SHACKLE DIMENSIONS TO BE FINALIZED DURING DETAILED DESIGN PHASE.

REVISION

NO	BY	DESCRIPTION	DATE	CHK	APVD
A	LLE	ISSUED FOR INTERNAL REVIEW	29 JAN 04	JR	JO
B	LLE	ISSUED FOR INTERNAL/AMP/GT REVIEW	10 FEB 04	JR	JO
C	THP	4 3/4" R4 CHAIN WAS 4 1/2" R4	11 MAR 04		

PRELIMINARY
MARCH 11, 2004

PROPRIETARY

Atlantia Offshore Limited

GulfTerra

ATWATER VALLEY HUB FACILITY

SEMI-SUBMERSIBLE FPU

TYPICAL MOORING LINE ARRANGEMENT

SCALE: 1:5500	DATE
DESIGNED BY: LLE	23 JAN 04
DTIC CHK BY: JR	09 FEB 04
ENGRG CHK BY: JR	FEB 04
QA CHK BY: PS	FEB 04
APPROVED BY: JO	FEB 04
PROJECT NUMBER: 23138	

DRAWING NUMBER: 23138-DG-3101
CLIENT DRAWING NUMBER:
SHEET 1 OF 2
REV C

G:\DG\23138\23138-DG-3101-04-DG.dwg 12 Mar 2004 12:11

APPENDIX B
GENERAL

CONTACT

Judy Davidson
Anadarko Petroleum Corporation
1201 Lake Robbins Drive
The Woodlands, Texas 77380
832-636-8766
judy_davidson@Anadarko.com

PROJECT NAME

Jubilee

PRODUCTION RATES AND LIFE OF RESERVES

Life of reserves	Est peak production	Est average production	Type of production

NEW OR UNUSUAL TECHNOLOGY

The Mississippi Canyon Block 920 Independence Hub will include 12 polyester mooring lines. The mooring system will be designed with the capability to hold the facility on location in 100-year hurricane or 100-year loop current conditions while meeting code strength requirements.

BONDING

In accordance with Notice to Lessees (NTL) 2000-G16 which implements the bond coverage requirements for Outer Continental Shelf general lease surety bonds contained in 30 CFR 256, Subpart I, Anadarko has a $3,000,000 area-wide general lease surety bond on file with the Minerals Management Service.

Additionally, NTL 98-18N addresses how MMS has the authority to require additional security to cover full plugging, site clearance and other associated lease liabilities which may be in excess of the general lease surety bonds. These activities are reviewed on a case-by-case basis and, if deemed warranted, Minerals Management Service will provide such notification to Anadarko.

Oil Spill Financial Responsibility is in place on this lease as required by OPA 90 regulations.

ONSHORE BASE AND SUPPORT VESSELS

Anadarko will use two existing onshore support bases in Fourchon and Venice, Louisiana during completion and production operations associated with this project.

The onshore support base in Fourchon, Louisiana, will serve as a port of debarkation for supplies and crews for development operations. This base is located approximately 150 miles from the project area. The onshore support base in Venice, Louisiana will be used as a backup base. This base is located approximately 160 miles from the project area. Helicopters will be dispatched from Galliano, Louisiana. Helicopters will average one round trip per day to the Independence Hub.

The bases are capable of providing the services necessary for the proposed activities. They each have 24-hour service, a radio tower with a phone patch, dock space, equipment, and supply storage base, drinking and drill water, etc. These bases will also serve as a loading point for tools, equipment and machinery, crew changes, transportation base, and temporary storage for materials and equipment. These facilities typically include outdoor storage, forklift and crane service, dock, trailer facilities and parking.

In the event of changes in weather or operational conditions, a small amount of vessel and helicopter traffic may be dispatched from other bases. However, it is expected that this will only be on a temporary basis and vessel traffic and helicopter transport should return to the primary and secondary bases as timely as possible.

Support vessels and travel frequency during development activities are as follows:

Support Vessel	Installation Operations	Production
Pipeline Installation - Crew Boat	3 trips total	NA
Pipeline Installation – Supply Vessel	15 trips total	NA
Hub Installation - Supply Boat	3 trips total	1/week
Helicopter	Daily	Daily

Personal vehicles will be the main means of transportation to transfer personnel from various locations to the shore base. The most practical, direct route permitted by the weather and traffic conditions will be utilized for crew boat and supply boats.

LEASE STIPULATIONS

Oil and gas activities on the OCS are subject to stipulations developed before the lease sale; these are attached to the lease instrument, as necessary, in the form of mitigating measures. The MMS is responsible for ensuring full compliance with stipulations.

Lease Stipulation No. 1 – Military Warning Area. This stipulation has been applied to blocks in military warning areas to mitigate potential multiple-use conflicts. The stipulation reduces potential impacts, primarily those associated with safety, by curtailing OCS operations and support activities in areas where military operations are being conducted. One of the requirements of this stipulation is that the operator notify the military prior to conducting oil and gas activities, and if required, enter into an agreement to provide for positive control of boats, ships and aircraft operating in the warning area. Anadarko will contact the Eglin Water Test Area 3 (EWTA-3) prior to conducting development operations on these blocks.

Lease Stipulations No. 2 and 3 – Evacuation and Coordination. The evacuation and coordination stipulations have been applied to blocks in the Eglin Water Test Areas and are designed to prevent space-use conflicts between oil and gas industry and military operations in the Gulf of Mexico. They provide for evacuation of personnel and shut-in of operations during any event conducted by the military that could pose a danger to ongoing operations. For this reason, close coordination is required between the oil and gas industry and the military. Anadarko will notify both the MMS and EWTA-3 prior to conducting operations and provide a contact to be notified if the terms of these stipulations are implemented.

Stipulation No. 4 – Marine Protected Species
This stipulation is meant to reduce the potential taking of marine protected species. Anadarko will operate in accordance with NTL 2003-G10 to minimize the risk of vessel strikes to protected species and will report observations of injured or dead protected species. Anadarko will operate in accordance with NTL 2003-G11 to prevent intentional and/or accidental introduction of debris into the marine environment.

Related OCS Facilities and Operations

Seven lease term pipelines will transport gas full well stream from the subsea wellheads to subsea manifolds The production will then be transported via two right-of-way pipelines (8″ and 8″ x 10″) approximately 25 miles in length to the floating production system (FPS) located in Mississippi Canyon Block 920. These pipelines are designed to transport a maximum of 500 MMCFD per day. Actual production rates over the life of the reservoir are estimated to range from ___ to ___ MMCFD. Shut-in time for the subsurface valve at the wellhead is 45 seconds. Shut-in time for the board valve is 45 seconds.

An electro-hydraulic steel tube (super duplex) umbilical, used to control and monitor the subsea facilities, will connect the subsea facilities to a Master Control Station on the Independence Hub in Mississippi Canyon Block 920. The main umbilical will end in a subsea termination assembly adjacent to the manifold location. From there, in-field umbilicals will connect to the in-field termination assemblies at the well locations.

The 8″ and 8″ x 10″ pipelines and the associated control umbilicals will be permitted as right-of-way pipelines. Chemicals which will be pumped through the umbilicals include: MEG - mono-ethylene glycol, MeOH – methanol, Corrosion Inhibitor (03VD042), Scale Inhibitor (EC6085A), Paraffin Inhibitor (EC6530A), and Paraffin Dispersant (EC6002A).

Transportation Information

The recombined gas and condensate will depart MC 920 Hub platform via a 20″ pipeline, approximately 140 miles in length, and travel to a proposed valve platform located at West Delta Block 68.

Hydrocarbons will depart the West Delta Block 68 platform via a proposed 20" and 24" pipeline, respectively, to be installed by Tennessee Gas Pipeline. MMS approved the applications for both lines on March 29, 2005.

The 24" pipeline (segment number 15034) will terminate at a subsea tie-in on an existing Tennessee Gas line in Grand Isle Block 32, and be transported to an existing platform in Louisiana state waters. The 20" line (segment number 15033) will travel to the federal/state boundary line in West Delta Block 16 and continue to the aforementioned platform in Louisiana state waters.

Production will depart the existing platform in Louisiana state waters via a common line that terminates at Tennessee's onshore compression/separation/storage facility located at Port Sulphur, Louisiana.

APPENDIX C
GEOLOGICAL, GEOPHYSICAL AND H_2S INFORMATION

The Conservation Information Document provides a complete analysis of the geological and geophysical data and was submitted to MMS on November 23, 2004.

STRUCTURE CONTOUR MAPS

Current structure map(s) drawn on the top of each productive hydrocarbon sand showing the entire lease block, the surface location of each well and locations of geological cross-sections, are included as **Attachment C-1.**

INTERPRETED SEISMIC LINES

Interpreted seismic lines were submitted with the Exploration Plan(s).

GEOLOGICAL STRUCTURE CROSS SECTION

Geological structure cross sections were submitted with the Exploration Plan(s).

SHALLOW HAZARDS REPORT

A shallow hazard report covering Atwater Valley Blocks 305 and 349 was submitted with the Initial Exploration Plan. A shallow hazard report covering Mississippi Canyon Block 920 was submitted to MMS under separate cover.

SHALLOW HAZARDS ANALYSIS

A shallow hazards analysis was prepared for the surface locations, evaluating seafloor and subsurface geologic and manmade features and conditions, and was submitted with the Exploration Plan(s).

Pipelines will be permitted under separate cover and permitted as individual right-of-way pipeline applications and lease term pipeline applications. The applications contain individual hazard assessment.

HIGH RESOLUTION SEISMIC LINES

This information was submitted with the Exploration Plans.

HYDROGEN SULFIDE

MMS determined Atwater Valley Blocks 305 and 349 to be H_2S absent by letter dated October 21, 2002.

APPENDIX D
BIOLOGICAL AND PHYSICAL INFORMATION

Chemosynthetic Information

Activities proposed in this DOCD could disturb seafloor areas in water depths of 400 meters (1,312 feet) or greater; therefore, information for the potential of encountering chemosynthetic communities is included as follows:

Maps

No new drilling operations are proposed in this DOCD. Maps prepared using 3-D seismic data depicting bathymetry, seafloor, and shallow geological features, the surface locations of the wells, and a radius circle of 1,500 feet around each proposed location were submitted previously in the Shallow Hazards Survey Report. Maps showing the final surface locations of the wells already drilled are incorporated in **Attachment D-1** for informational purposes.

Fugro found no evidence for active hydrocarbon venting or other environments that would potentially support development of chemosynthetic communities, either at the proposed anchor sites for the Mississippi Canyon Block 920 Platform A or elsewhere in the survey area.

Analysis

Using 3-D seismic information, all seafloor features and areas that could be disturbed by the activities proposed in this plan have been identified. The likelihood of these proposed activities disturbing these seafloor and shallow geologic features is discussed in the following summary statement:

Existing Well Locations:

No Associated Anchors – No Disturbances within 1,500 feet of Chemosynthetic Communities

- No drilling operations are proposed in this DOCD; therefore, there will be no discharges of mud and/or cuttings.
- Features or areas that could support high-density chemosynthetic communities are **not** located within 500 feet of the surface locations of existing wells, the site of installation of the subsea trees.

Lease Flowlines, Manifolds, and Jumpers:

No Associated Anchors – No Disturbances between 250 and 500 feet of Chemosynthetic Communities

- Features or areas that could support high-density chemosynthetic communities are **not** located within 250 feet of any seafloor disturbances resulting from construction of the proposed flowlines, manifolds, and jumpers.

Topographic Features Information

The activities proposed in this plan will not take place within 500 feet of any identified topographic feature. Anadarko will utilize a dynamically positioned rig to conduct the proposed completion operations. The activities proposed in this plan will not affect a topographic feature.

Live Bottom (Pinnacle Trend) Information

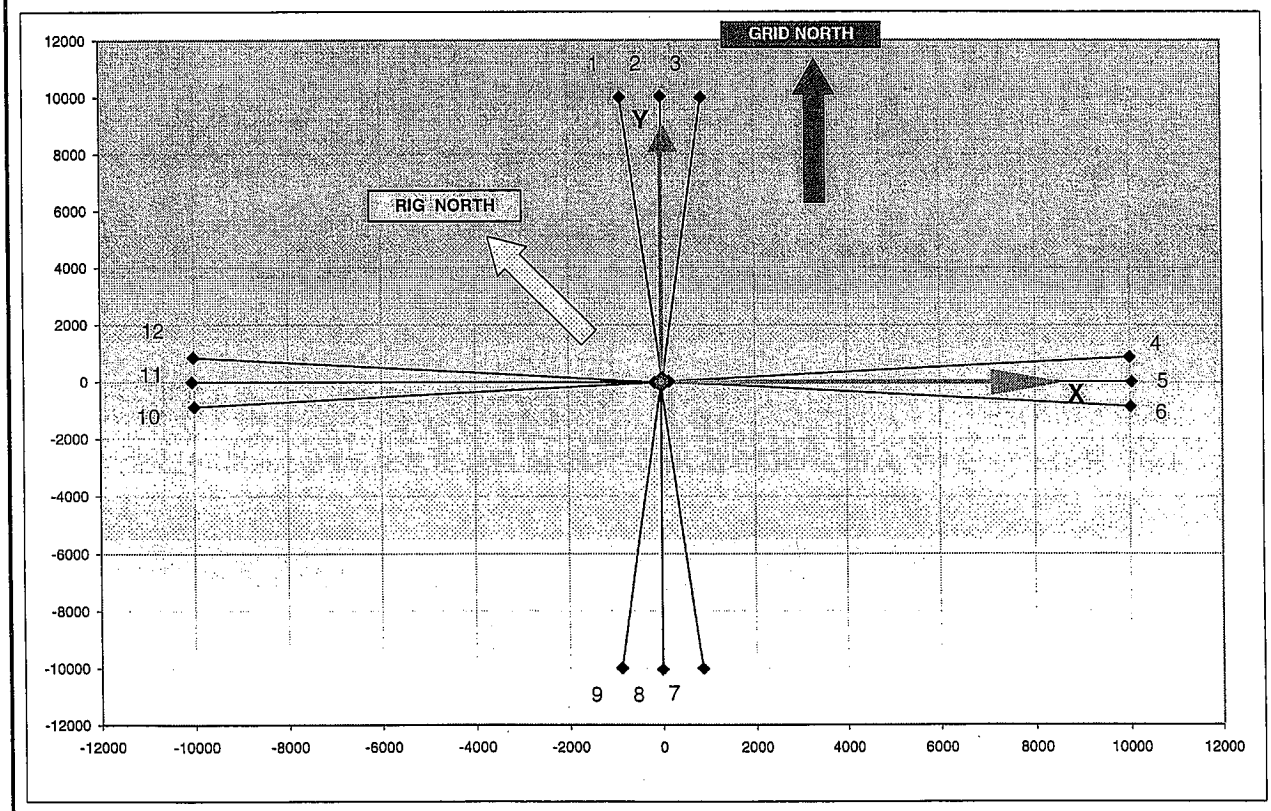
These leases do not contain Live Bottom (Pinnacle Trend) Stipulations.

Remotely Operated Vehicle (ROV) Surveys

The ROV survey requirement was not invoked in MMS' exploration plan approval letter dated October 21, 2002.

INDEPENDENCE HUB - MC920
8,000 ft WD
POLYESTER TAUT MOORING PATTERN
MOORING LEGS - COORDINATES **RELATIVE TO GRID NORTH**

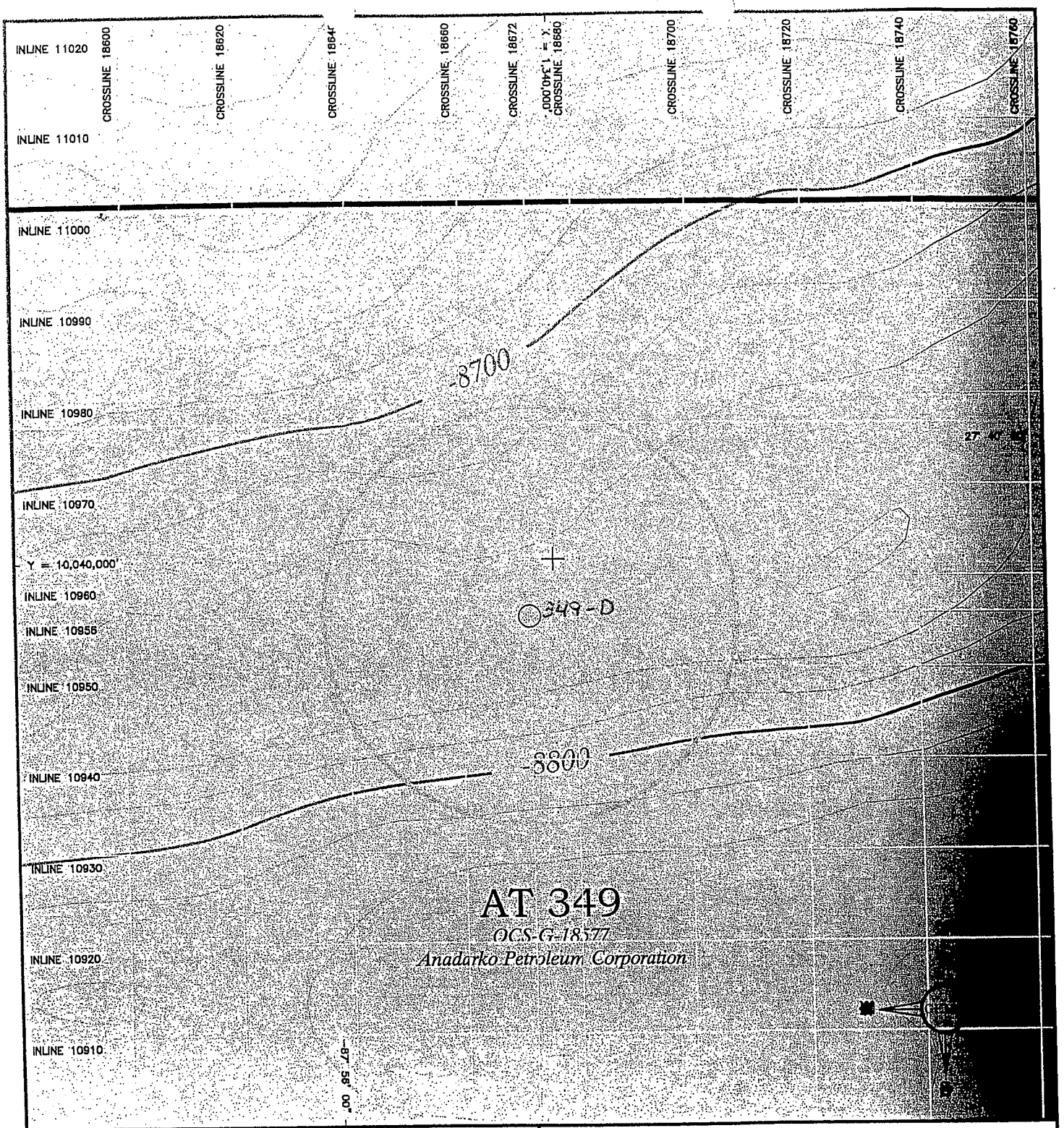
Line	Fairleads Coordinates			Spread Angle	Scope	Anchor Coordinates Relative to Platform Center		Anchor / UTM Coordinates	
(#)	x (feet)	y (feet)	z (feet)	(deg.)	(feet)	x (feet)	y (feet)	x (feet)	y (feet)
1	8.5	157.0	-92	-5	9893	-854	10012	1,321,786	10,203,052
2	15.6	149.9	-92	0	9893	16	10042	1,322,656	10,203,082
3	22.6	142.8	-92	5	9893	885	9998	1,323,525	10,203,038
4	142.8	22.6	-92	85	9893	9998	885	1,332,638	10,193,925
5	149.9	15.6	-92	90	9893	10042	16	1,332,682	10,193,056
6	157.0	8.5	-92	95	9893	10012	-854	1,332,652	10,192,186
7	-8.5	-157.0	-92	175	9893	854	-10012	1,323,494	10,183,028
8	-15.6	-149.9	-92	180	9893	-16	-10042	1,322,624	10,182,998
9	-22.6	-142.8	-92	185	9893	-885	-9998	1,321,755	10,183,042
10	-142.8	-22.6	-92	265	9893	-9998	-885	1,312,642	10,192,155
11	-149.9	-15.6	-92	270	9893	-10042	-16	1,312,598	10,193,024
12	-157.0	-8.5	-92	275	9893	-10012	854	1,312,628	10,193,894



* NOTE: Spread angle is measured CLOCKWISE from GRID NORTH. Scope is measured from Fairleads.

Coordinates Below Are Based Upon Rev. H of Independence Hub Facility Design Basis

Platform UTM X Coordinate	1,322,640
Platform UTM Y Coordinate	10,193,040



CONTOUR INTERVAL: 20 FEET

WATER DEPTH CONTOUR, IN FEET.

CIRCLE REPRESENTS 1500 FT RADIUS AROUND PROPOSED WELLSITE.

0 500 1000 1500 2000

SCALE 1 : 12,000
SCALE 1" = 1000'

WATER DEPTH

-8300
-8400
-8500
-8600
-8700
-8800
-8860

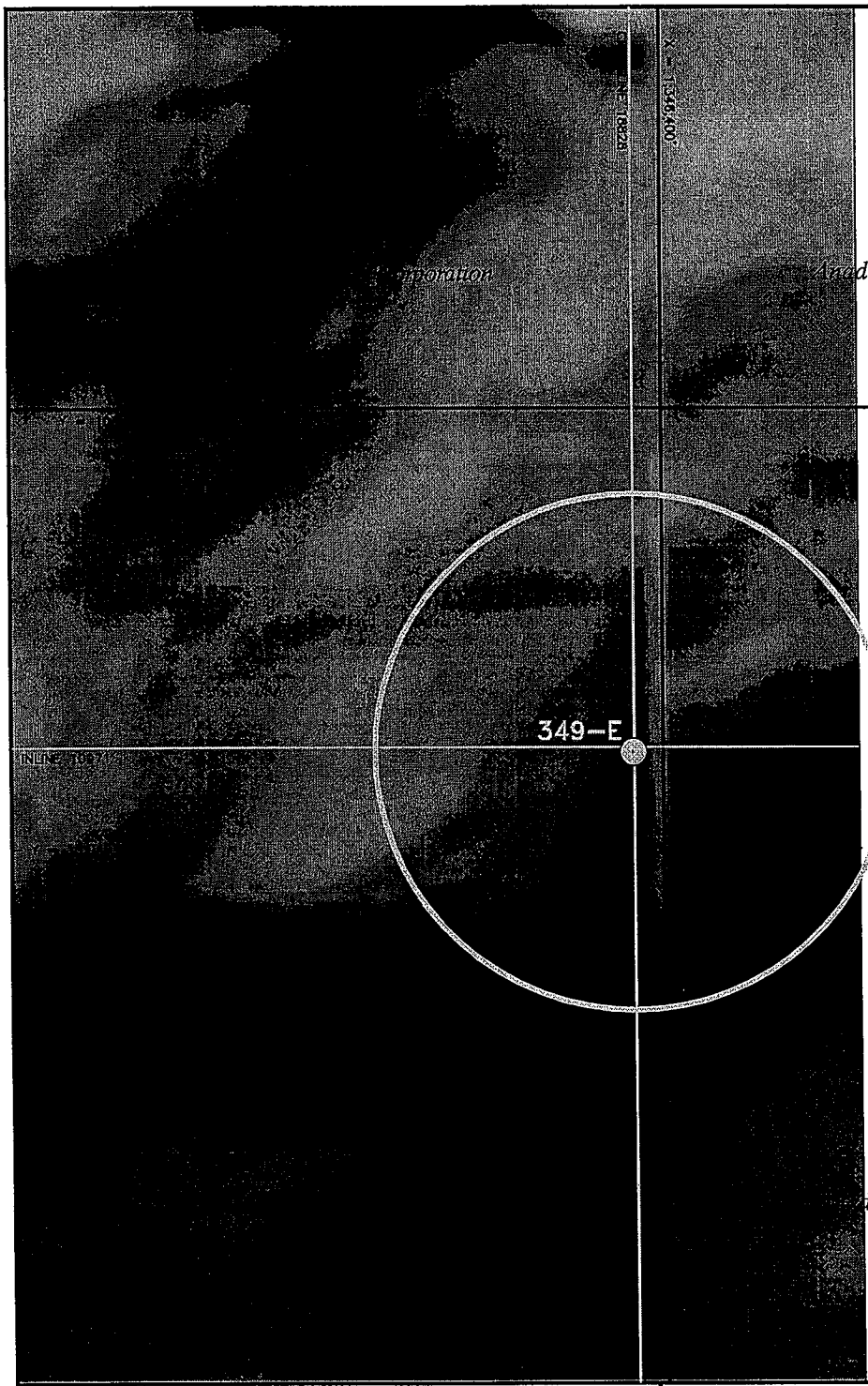
PROJECT NO.: 0703-699

FILE NAME: 699B_P1.DWG

ANADARKO PETROLEUM CORPORATION

BATHYMETRY MAP
BLOCK 349
ATWATER VALLEY
GULF OF MEXICO
Well No. 2

MAP NO. 1



N
W GEMS E
S
GRID NORTH

LL 265
OCS-G-23472
Anadarko Petroleum Corporation

27° 40' 00" W

LL 309
OCS-G-23473
Anadarko Petroleum Corporation

87° 54' 00" N

E PROPOSED WELL LOCATION.

CIRCLE REPRESENTS 1500 FT RADIUS AROUND PROPOSED WELLSITE.

WATER DEPTH
SHALLOW (-8300)
DEEP (-8860)

0 500 1000 1500 2000
SCALE 1 : 12,000 or 1" = 1000'

PROJECT NO.: 0105-935

FILE NAME: 935R-349E_P2.DWG

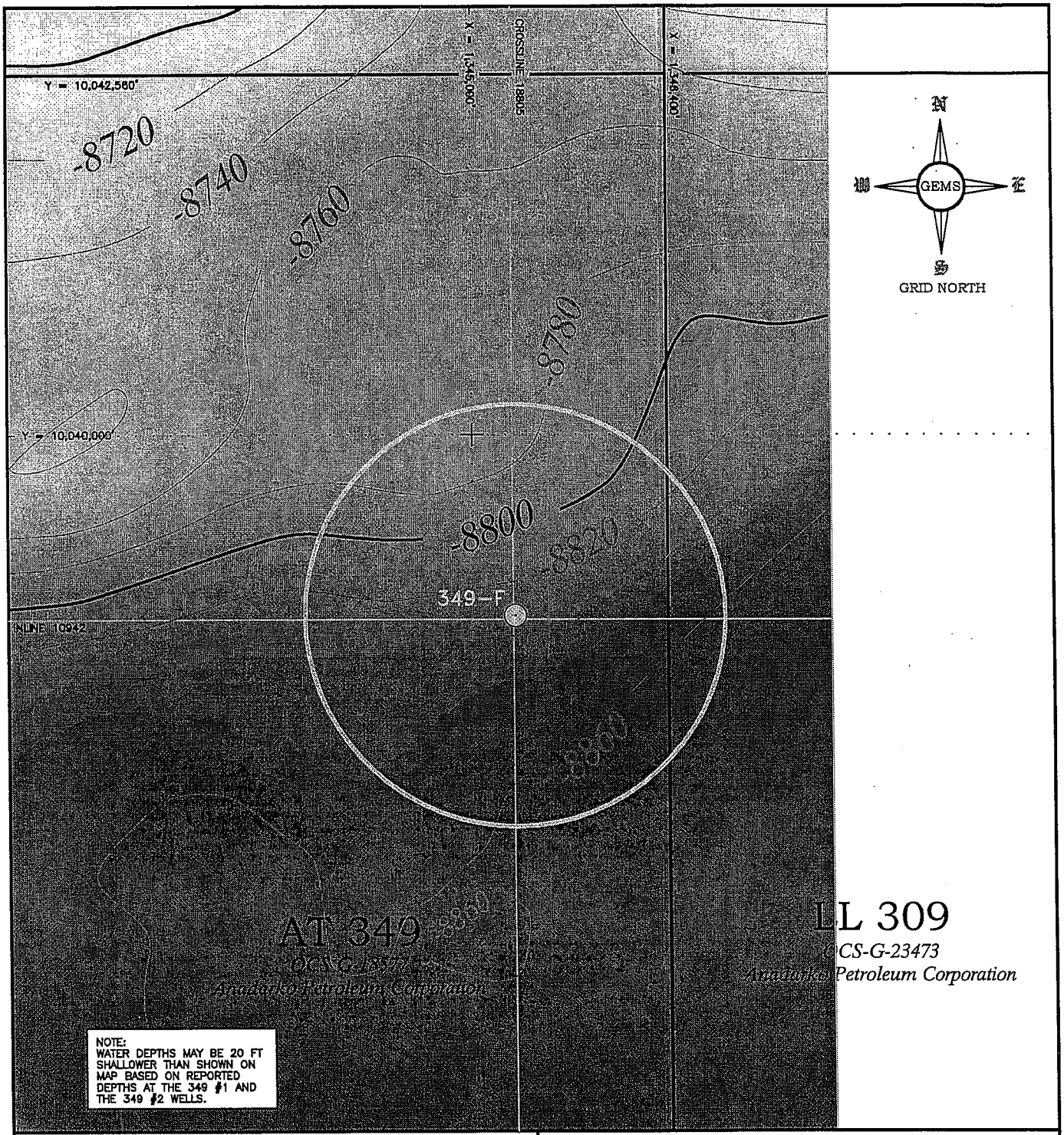
ANADARKO PETROLEUM CORPORATION

SEAFLOOR RENDERING
BLOCK 349
ATWATER VALLEY AREA
GULF OF MEXICO

GEOSCIENCE EARTH & MARINE SERVICES, INC.

Well No. 3

MAP NO. 2-349-E



PROJECT NO.: 0105-935

FILE NAME: 935B-349F_P1.DWG

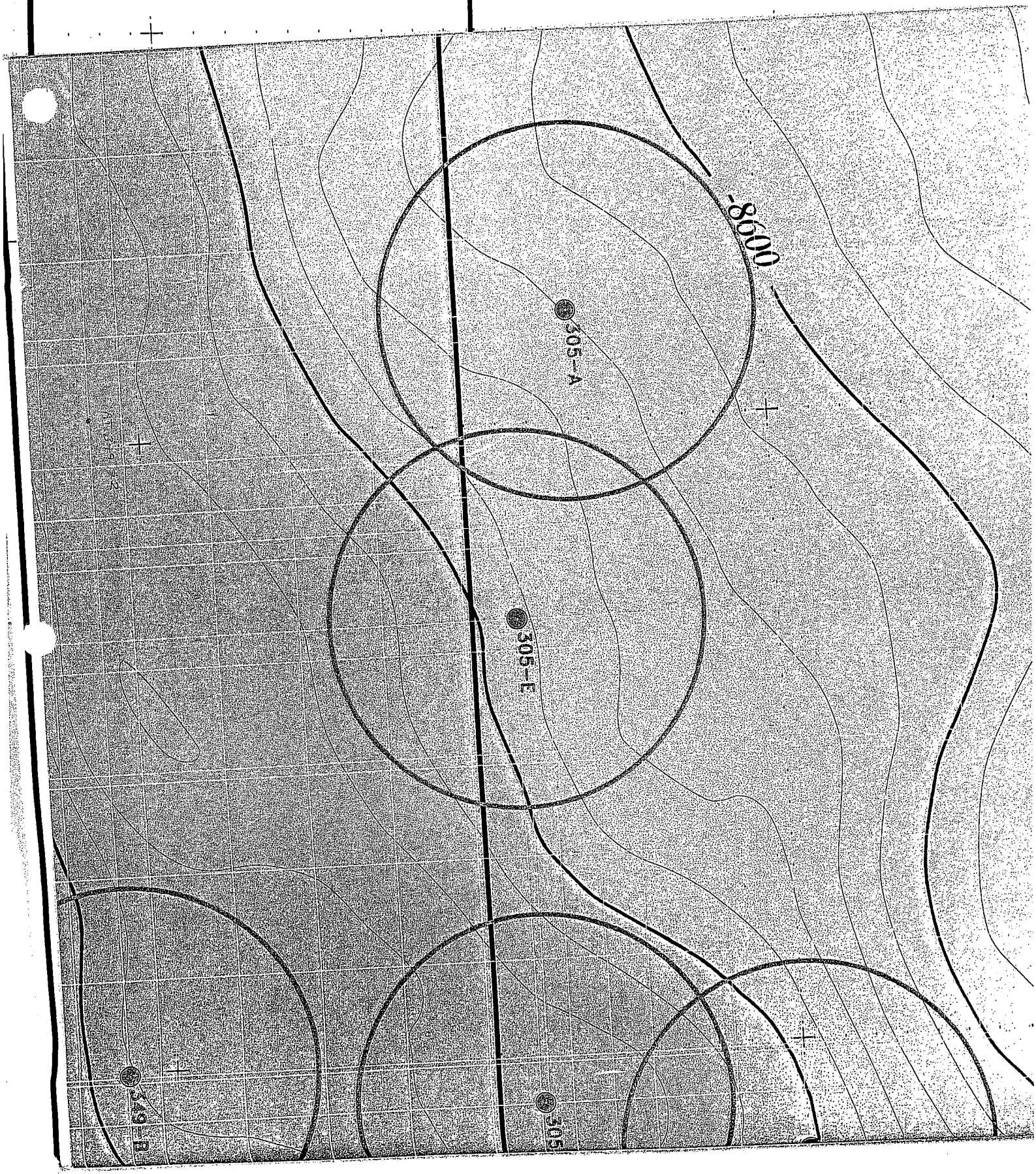
ANADARKO PETROLEUM CORPORATION

BATHYMETRY MAP

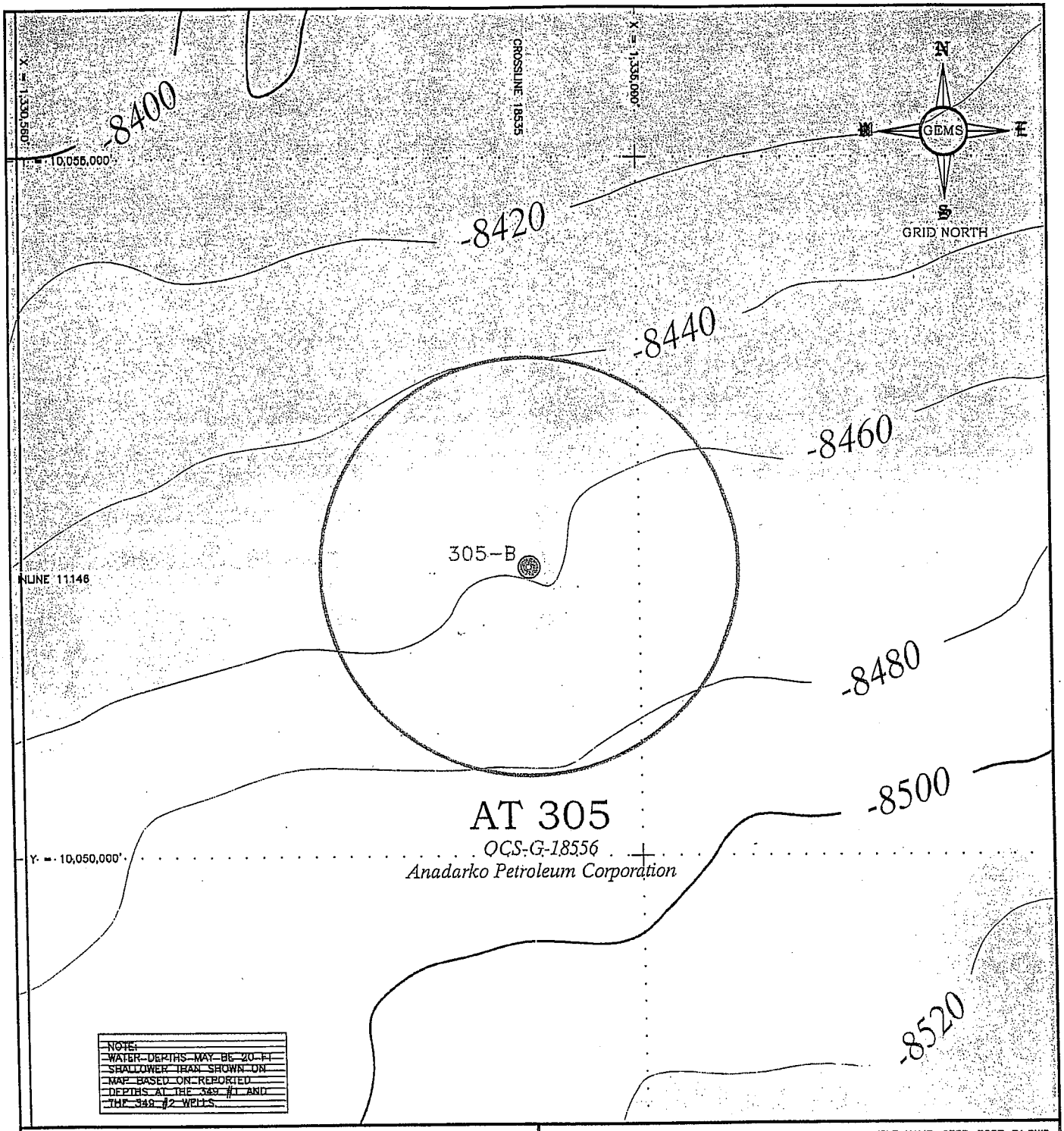
BLOCK 349
ATWATER VALLEY AREA
GULF OF MEXICO
Well No. 4

GEOSCIENCE EARTH & MARINE SERVICES, INC.

MAP NO. 1-349-F



Bathymetry Map
Atwater Valley Block 305
Location A (Well No. 1)



CONTOUR INTERVAL: 20 FEET

B — PROPOSED WELL LOCATION.

CIRCLE REPRESENTS 1500 FT RADIUS AROUND PROPOSED WELLSITE.

-8500 — WATER DEPTH CONTOUR, IN FEET.

WATER DEPTH

-8400

-8500

-8520

0 500 1000 1500 2000

SCALE 1 : 12,000 or 1" = 1000'

PROJECT NO.: 0105-935

FILE NAME: 935B-305B_P1.DWG

ANADARKO PETROLEUM CORPORATION

BATHYMETRY MAP

BLOCK 305

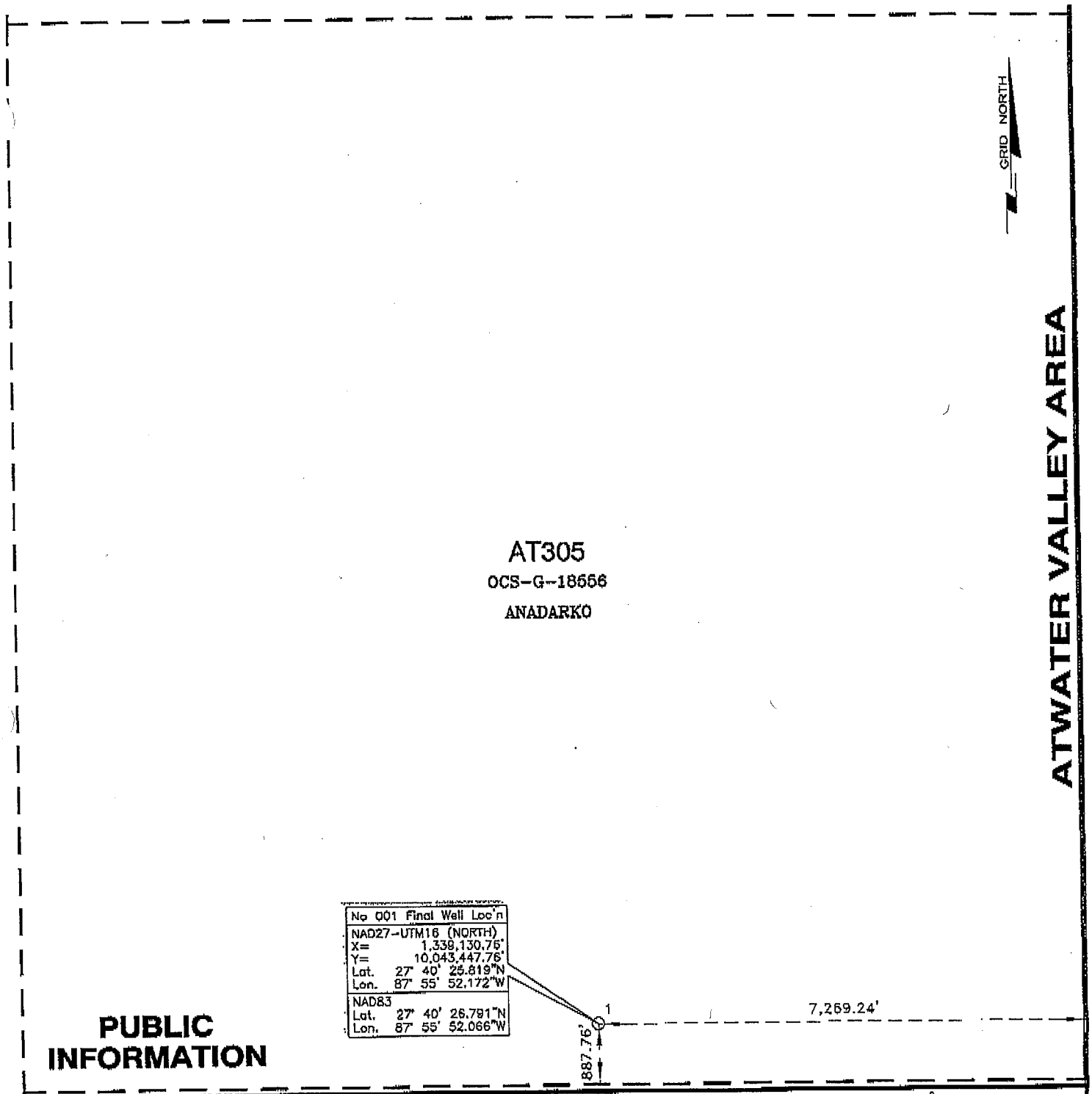
ATWATER VALLEY AREA

GULF OF MEXICO

GEOSCIENCE EARTH & MARINE SERVICES, INC.

Well No. 2

MAP NO. 1-305-B



I HEREBY CERTIFY THAT THE ABOVE FINAL WELL LOCATION IS CORRECT.

STATE OF LOUISIANA
STEPHEN R. HENRY
REG. No. 4903
REGISTERED PROFESSIONAL LAND SURVEYOR

REG. PROFESSIONAL LAND SURVEYOR NO. 4903
STATE OF LOUISIANA

NOTE:
1) SURVEYED COORDINATES TRANSFORMED FROM NAD83 (GPS DATUM) TO NAD27 (CHART DATUM) USING NADCON VERSION 2.1.

Printed: 2/23/05

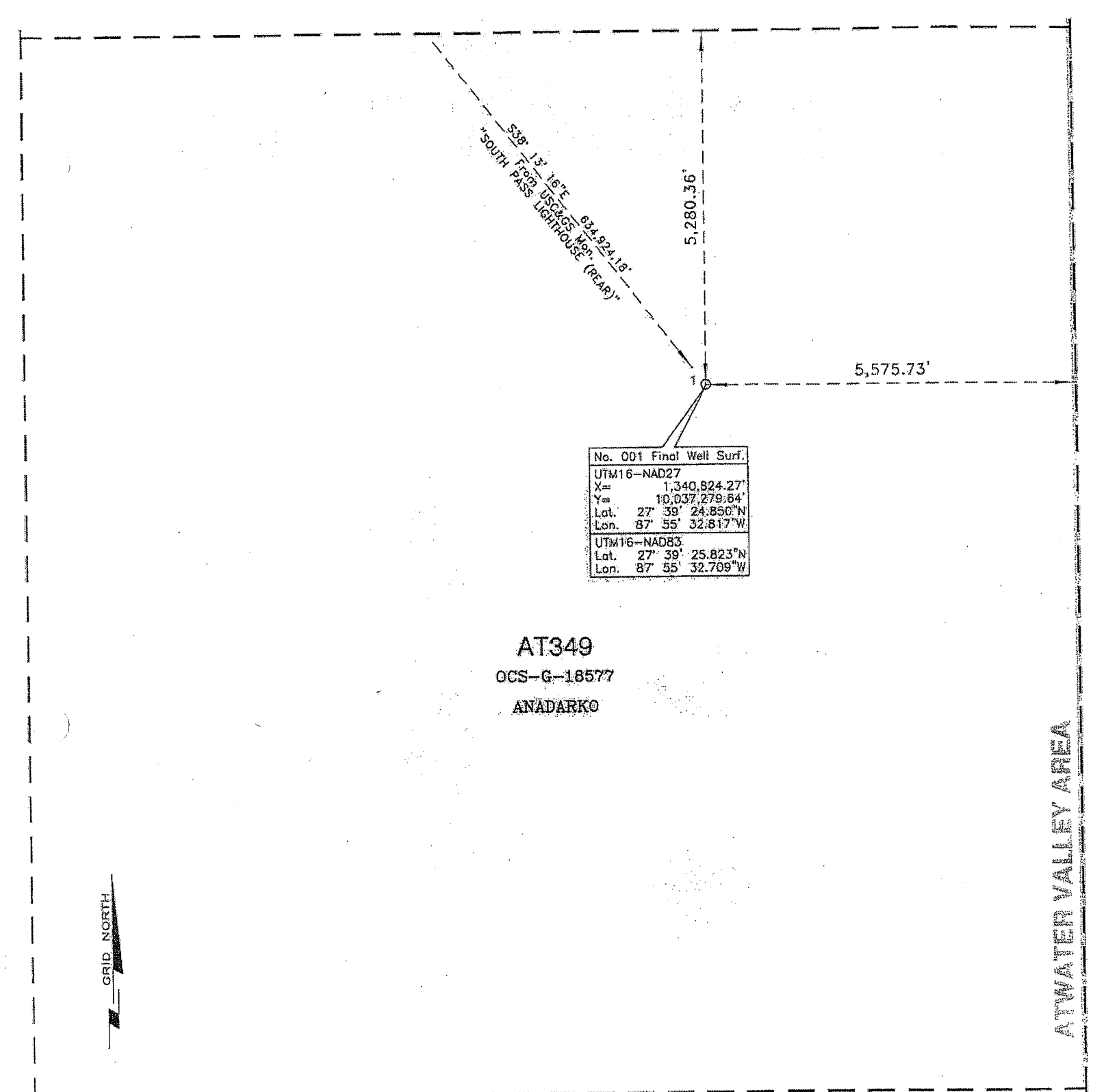
Anadarko Petroleum Corporation

FINAL LOCATION
OCS-G-18556 WELL NO. 001

BLOCK 305
ATWATER VALLEY AREA
GULF OF MEXICO

FUGRO CHANCE INC.
200 Dulles Dr. Lafayette, Louisiana 70506-3001 (337) 237-1500

GEODETIC DATUM: NAD27 PROJECTION: U.T.M. 16 (NORTH) GRID UNITS: US SURVEY FEET		SCALE IN FEET 0 2,000'	
Job No.: 05-0657	Date: 2/22/05	Drwn: VAG	Chart: 1 Of: 1
Dwgfile: C:\WellPermit\UTM16\AT\Permit\305F1			



I HEREBY CERTIFY THAT THE ABOVE FINAL WELL SURFACE LOCATION IS CORRECT.

STATE OF LOUISIANA
LIONEL J CORMIER
REG No. 4401
REGISTERED PROFESSIONAL LAND SURVEYOR

Lionel J Cormier

REG. PROFESSIONAL LAND SURVEYOR NO. 4401
STATE OF LOUISIANA

NOTES:

1) SURVEYED COORDINATES TRANSFORMED FROM NAD83 (GPS DATUM) TO NAD27 (CHART DATUM) USING NADCON VERSION 2.1.

Printed: 2/28/03

Anadarko

FINAL LOCATION
OCS-G-18577 WELL NO.001

BLOCK 349
ATWATER VALLEY AREA
GULF OF MEXICO

FUGRO CHANCE INC.
200 Dulles Dr. Lafayette, Louisiana 70506-3001 (337) 237-1300

GEODETIC DATUM: NAD27 PROJECTION: U.T.M. 16 GRID UNITS: US SURVEY FEET	SCALE IN FEET 0 — 2,000'
Job No.: 03-0632 Date: 2/28/03	Drwn: RDT
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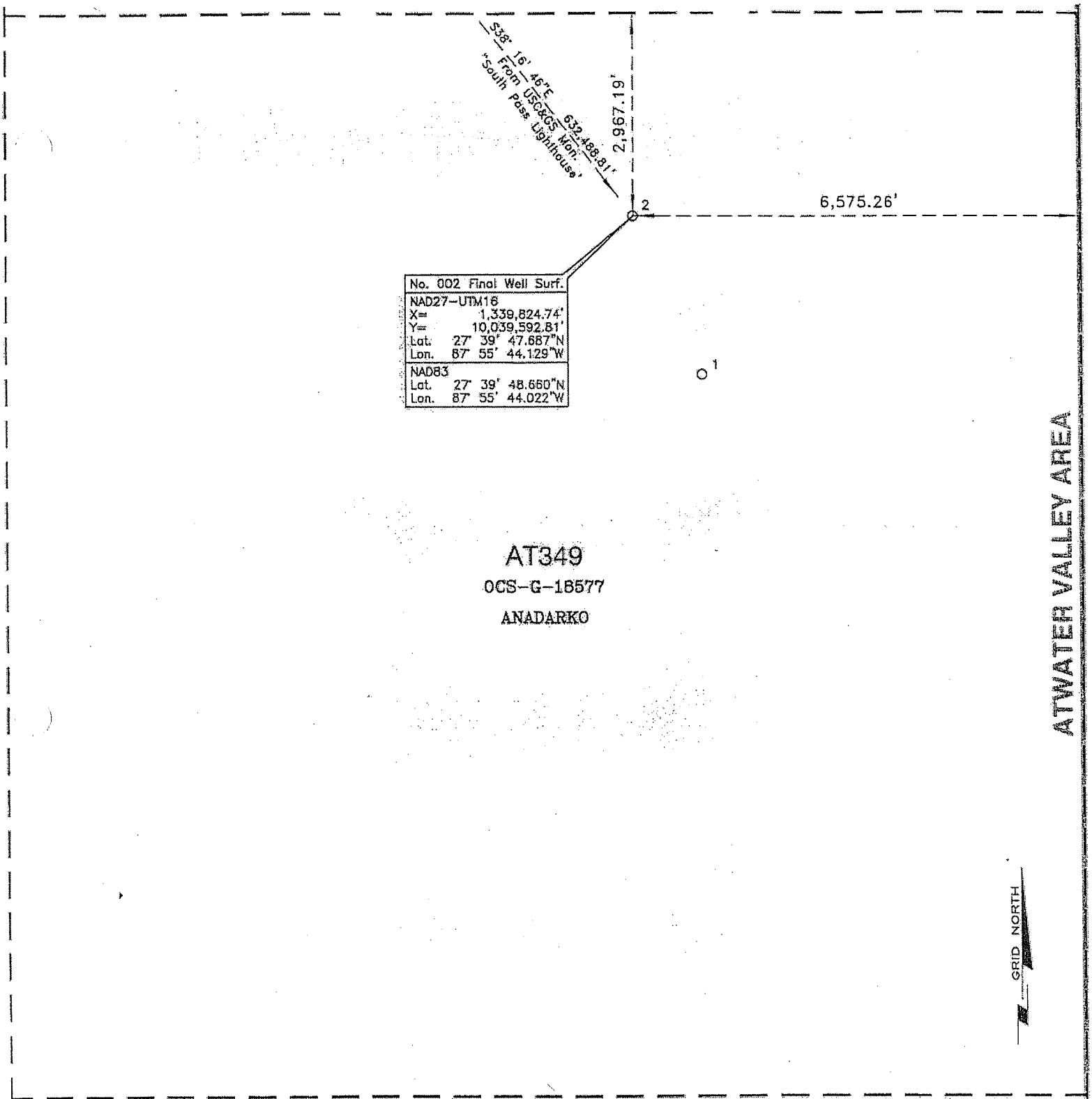


I HEREBY CERTIFY THAT THE ABOVE FINAL WELL SURFACE LOCATION IS CORRECT.

STATE OF LOUISIANA

LIONEL J. CORMIER
REG. No. 4401
REGISTERED
PROFESSIONAL
LAND SURVEYOR

REG. PROFESSIONAL LAND SURVEYOR NO. 4401
STATE OF LOUISIANA

PUBLIC INFORMATION

Printed: 2/5/04

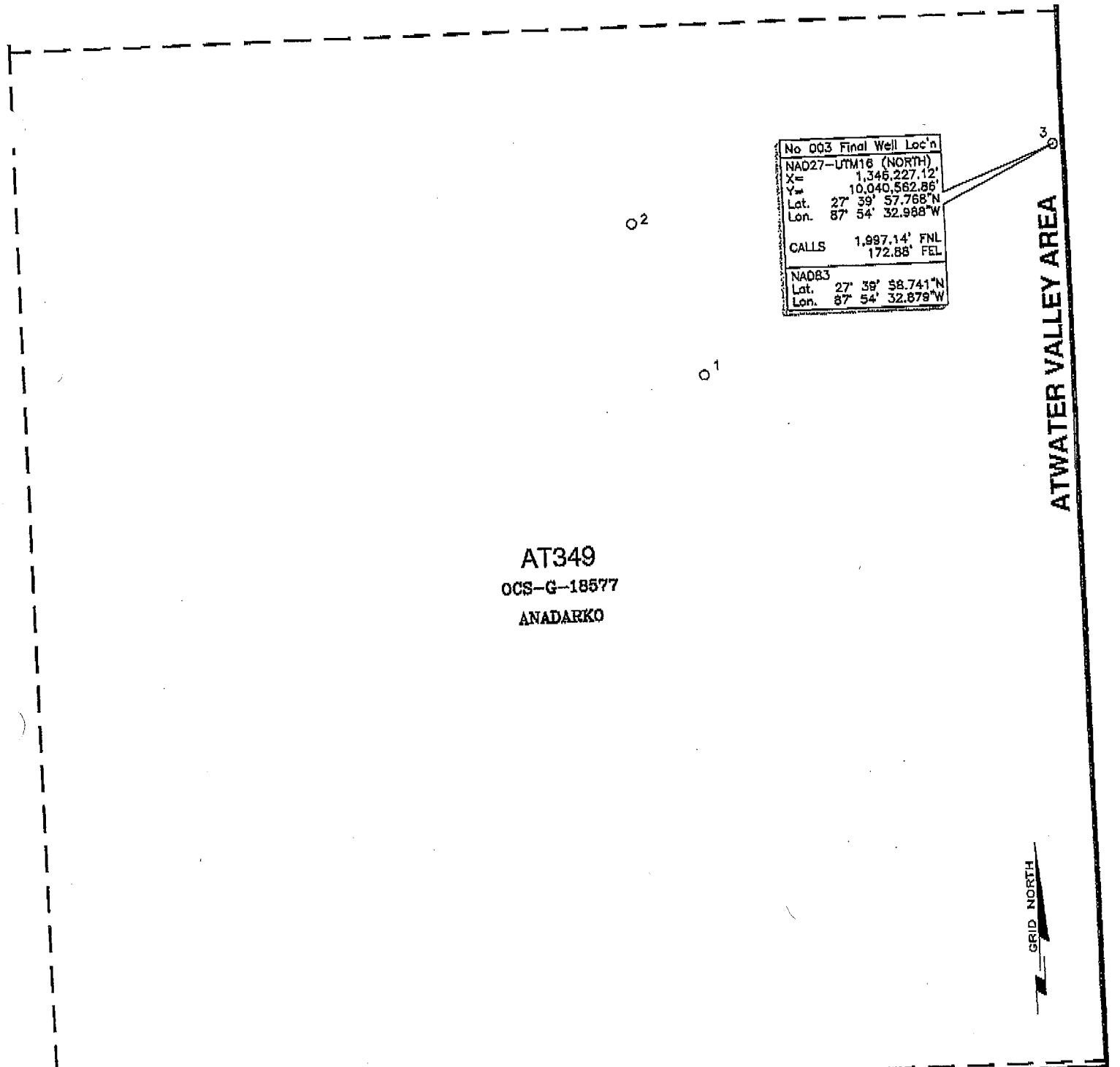
Anadarko Petroleum Corporation

FINAL LOCATION
OCS-G-18577 WELL NO. 002

BLOCK 349
ATWATER VALLEY AREA
GULF OF MEXICO

FUGRO CHANCE INC.
200 Dulles Dr. Lafayette, Louisiana 70506-3001 (337) 237-1500

GEODETIC DATUM: NAD27 PROJECTION: U.T.M. 16 GRID UNITS: US SURVEY FEET	SCALE IN FEET 0 2,000'
Job No.: 04-0418 | Date: 2/4/05 | Drwn: RDT	Chart: 1 Of: 1
Dwgfile: O:\WellPermit\UTM16\AT\Permit\34912	



I HEREBY CERTIFY THAT THE ABOVE FINAL WELL LOCATION IS CORRECT.

STATE OF LOUISIANA
STEPHEN R. HENRY
REG. No. 4903
REGISTERED PROFESSIONAL LAND SURVEYOR

REG. PROFESSIONAL LAND SURVEYOR NO. 4903
STATE OF LOUISIANA

NOTES:
1) SURVEYED COORDINATES TRANSFORMED FROM NAD83 (GPS DATUM) TO NAD27 (CHART DATUM) USING NADCON VERSION 2.1.

PUBLIC INFORMATION

Printed: 3/1/05

Anadarko Petroleum Corporation

FINAL LOCATION
OCS-G-18577 WELL NO. 003
BLOCK 349
ATWATER VALLEY AREA
GULF OF MEXICO

FUGRO CHANCE INC.
200 Dulles Dr. Lafayette, Louisiana 70506-3001 (337) 237-1500

GEODETIC DATUM: NAD27 PROJECTION: U.T.M. 15 GRID UNITS: US SURVEY FEET		SCALE IN FEET	0 2,000'
Job No.: 05-0764	Date: 03/01/05	Drwn: TCG	Chart: 1 Of: 1
Dwgfile: O:\WellPermit\UTM16\AT\Permit\349F3			

APPENDIX E
WASTES AND DISCHARGES INFORMATION

DISCHARGES

All discharges associated with development operations proposed in this plan will be in accordance with Minerals Management Service, U. S. Coast Guard and Environmental Protection Agency regulations.

Type of Waste	Amount to be Discharged	Maximum Discharge Rate	Treatment and/or Storage, Discharge Location and Discharge Method
Sanitary Wastes	233,600 gal/yr	640 gal/day	6" overboard line hull southwest column (Note 1)
Domestic waste	1,226,400 gal/yr	3360 gal/day	6" overboard line hull southwest column (Note 2)
Deck drainage	1,425,422 gal/yr	1,267,102 gal/day	2-66" dia open drain sump caissons hull northeast and southwest columns (Note 3)
Uncontaminated fresh or seawater	18,250,000 gal/yr	5000 gal/min	16" overboard caisson hull southwest column and 16" overboard caisson hull southeast caisson (Note 4)
Desalinization Unit Water	5,533,400 gal/yr	15,160 gal/day	16" overboard caisson hull southeast column (Note 5)
Uncontaminated bilge water	Up to 130 gpm into one sump pile	520 gal/min (emergency service only)	260 gal/min maximum only into each sump pile under emergency conditions. (Note 8)
Uncontaminated ballast water	2700 gal/min once a year for tank inspection	5400 gal/min (emergency service only)	Overboard discharge
Miscellaneous discharges to which treatment chemicals have been added	8,813,000,000 gal/year	29,376,000 gal/day	Seawater discharges to: 20" overboard caisson on northwest hull column, 24" overboard caisson northeast hull column and 16" overboard caisson on southeast hull column (Note 6)
Well treatment workover or completion fluids	Workover – 300 bbl/well Treatment – 250 bbl/well Completion – 3000 bbl/well	300 bbl/well	Discharge used fluids overboard, return excess to shore for credit
Produced Water	1000 bbl/day	3000 bbl/day	Discharge overboard

Note 1: Based on 40 men occupancy, 365 days/yr @ 10 flushes/day at 1.6 gal/flush
Note 2: Based on 40 men occupancy, 365 days/yr and 100 gal fresh water/day total per man less sanitary usage
Note 3: Based on Houma, LA, annual rainfall of 54" and design rate of 2"/hr rate over main deck and hull columns with 10% coverage of production deck.
Note 4: Based on running both firewater pumps for 10 minutes per day 365 days per year, discharging 2500 gpm each overboard.
Note 5: Based on RO pump operating at 14 gpm, with 5000 gal/day fresh water production. Pump runs 365 days/yr.
Note 6: Based on 3-6800 gpm seawater lift pumps running 300 days per year
Note 7: Produced waters were included in the Atwater Valley Block 305/349 DOCD for the Independence Hub.
Note 8: Based on pumps in one active column running at full capacity. Pumps can be throttled to reduce flow as desired (air diaphragm pumps).

Disposal Table (Wastes to be Disposed of, Not Discharged)

Disposed wastes describe those wastes generated by the proposed activity that are disposed of by means other than by release into the water of the GOM at the site where they are generated. These wastes can be disposed of by offsite release, injection, encapsulation, or placement at either onshore or offshore permitted locations for the purposes of returning them back to the environment.

Type of Waste Approximate Composition	**Amount***	**Name/Location of Disposal Facility**	**Treatment and/or Storage, Transport and Disposal Method**
Produced sand – Oil contaminated produced sand	400 bbls/y	Newpark Transfer Station (Venice, LA)	Land farm
Chemically treated Seawater/Freshwater – water to which chemical agents have been added.	20 bbl/well	U. S. Liquids, Fourchon, LA. or Newpark Environmental Services, Fourchon, LA.	Transport to shore base for pickup
Non-RCRA Exempt Solid Wastes/ Trash Plastic, paper, aluminum, food refuse	5 cubic meter/month	Galliano Waste Disposal, Galliano, LA. Or Waste Management, Raceland, LA.	Transport to shore base for pickup by municipal operations
Other RCRA – Exempt Wastes in Quantities > 50 bbl/month	NA	NA	NA
Hazardous Wastes in Reportable Quantities	NA	NA	NA
Norm Contaminated Wastes	NA	NA	NA

*Can be expressed as a volume, weight, or rate

APPENDIX F
OIL SPILL INFORMATION

1. SITE-SPECIFIC OSRP

N/A

2. REGIONAL OSRP INFORMATION

Anadarko is the only entity covered in their Regional Oil Spill Response Plan (OSRP) approved on November 10, 2003. Activities proposed in this DOCD will be covered by the Regional OSRP.

3. OSRO INFORMATION

Anadarko's primary equipment provider is Clean Gulf Associates (CGA). The Marine Spill Response Corporation's (MSRC) STARS network will provide closest available personnel, as well as an MSRC supervisor to operate the equipment.

4. WORST-CASE SCENARIO COMPARISON

Category	Regional OSRP WCD	DOCD WCD
Type of Activity	Production >10 miles	Production
Facility Location (Area/Block)	GC 608	MC 920
Facility Designation	Platform A	Platform A
Distance to Nearest Shoreline (miles)	120	90
Volume		
Storage Tanks (total)	2,675 bbls	455 bbls
Flowlines (on facility)	15 bbls	10 bbls
Pipelines	68.75 bbls	75 bbls
Uncontrolled Blowout	10,000 bbls	NA
Total Volume	12,758.75 bbls	540 bbls
Type of Oil(s) (crude, condensate, diesel)	Oil	Condensate
API Gravity	23	35

Category	Regional OSRP WCD	Proposed Activity WCD
Type of Activity	Production > 10 miles	Production > 10 miles
Spill Location	GC 608	AT 305/349
Facility Designation	Platform A	Wellbore
Distance to Nearest Shoreline	120	110
Volume		391 bbls (wellbore)
Storage Tanks	2,675 bbls	NA
Flowlines (on facility)	15 bbls	NA
Pipelines	68.75 bbls	1 bbl
Uncontrolled Blowout	10,000 bbls	NA
Total Volume	12,758.75 bbls	392 bbls
Type of Oil	Oil	Condensate
API Gravity	23	43

Anadarko has determined that the worst-case scenario from the activities proposed in this DOCD do not supercede the worst-case scenario for Green Canyon Block 608. A revised worst-case discharge for Green Canyon Block 608 is being submitted concurrently to MMS for approval in our OSRP for far-shore activities.

Since Anadarko Petroleum Corporation has the capability to respond to the worst-case spill scenario included in its Regional OSRP, and since the worst-case scenario determined for our DOCD does not replace the worst-case scenario in our Regional OSRP, I hereby certify that Anadarko has the capability to respond, to the maximum extent practicable, to a worst-case discharge, or a substantial threat of such a discharge, resulting from the activities proposed in our DOCD.

5. FACILITY TANKS, PRODUCTION VESSELS

All facility tanks of 25 barrels or more.

Type of Storage Tank	Type of Facility	Tank Capacity (bbls)	Number of Tanks	Total Capacity (bbls)	Fluid Gravity (API)
Fuel Oil (Marine Diesel)	Platform	284	1	284	No. 2 Diesel
Jet Fuel	Platform	56	1	56	Jet Fuel
Production/Cond. Flash Separator	Platform	38	1	38	55
Production/Cond. Coalescer	Platform	77	1	77	55

6. DIESEL OIL SUPPLY VESSELS

a. Size of fuel supply vessel:	230'

b. Carrying capacity of fuel supply vessel:	309,270 gallons
c. Frequency of fuel transfers:	Weekly
d Route fuel supply vessel will take:	From the shorebase in Fourchon, LA to MC 920 or Atwater Valley Block 305/349.

7. SUPPORT VESSELS FUEL TANKS

The estimated total storage capacity (maximum per class of vessel in the field at any given time) of fuel tanks on the vessels supporting activities in this Plan are as follows:

a. Tugs	NA	Gallons
b. Supply Vessels	1	3,500 Gallons
c. Crew Vessels	1	800 Gallons
d Service Boats	1	1,500 Gallons

8. PRODUCED LIQUID HYDROCARBONS TRANSPORTATION VESSELS

Anadarko does not propose transfer of stored production and/or hydrocarbons by means other than a pipeline.

9. OIL- AND SYNTHETIC-BASED DRILLING FLUIDS

NA

10. BLOWOUT SCENARIO

The worst case discharge scenario for the Jubilee field development project is defined as an uncontrollable discharge to the surface through the 5-1/2" workstring during completion operations. Since the proposed producing reservoir (UM1-BM reservoir) is currently behind pipe, this occurrence would likely take place after perforating operations. Mechanically speaking, this scenario assumes that the pipe rams function on the sub-sea BOP stack but the shear/blind rams, internal BOP and TIW systems fail, allowing full wellbore fluid up the drill pipe and to the surface floor flowing to atmospheric pressure. It is also assumed, due to the high rate of production expected during the uncontrollable flow period, the well would experience a failed gravel pack and eventually sand up within a week after the occurrence. Maximum daily discharge is estimated to be 391 barrels.

For a relief well scenario, rig availability is typically not an issue. The time required to drill a relief well would be in the 30 day range depending on the well intersection depth.

11. OIL CHARACTERISTICS

ATWATER VALLEY BLOCKS 305 AND 349

Estimated API Gravity: 43.1
Estimated Bubble Point: 2940 psi
Estimated Viscosity: 1.89 cp@214 F
Anticipated Wax and Asphaltene Content: 4.6%

Anticipated Flash Stock Tank Liquid Analysis:

	Mole %	Weight
Hydrogen Sulfide	----------	----------
Carbon Dioxide	----------	----------
Nitrogen	----------	----------
Methane	0	
Ethane	0	
Propane	0.05	
Iso-butane	0	
n-butane	0	
Iso-pentane	0	
n-pentane	0.01	
Hexanes	0.01	
Heptanes Plus	99.93	

Anticipated Properties of Flash Gas:

Gas Calculated Specific Gravity (Air=1)	0.56
Gas Heat of Combustion (Btu/cuft@60F) Dry	1042
Gas Heat of Combustion (Btu/cuft@60F)Wet	1024
Gas Compressibility (@ 1atm & 60F) Z	0.9978

MISSISSIPPI CANYON BLOCK 920 – INDEPENDENCE HUB

Estimated API Gravity:	35.0 API
Estimated Bubble Point:	N/A psi
Estimated Viscosity:	N/A
Anticipated Wax and Asphaltene Content:	N/A

Anticipated Flash Stock Tank Liquid Analysis:

	Mole %	Weight
Hydrogen Sulfide	0.00	0.00
Carbon Dioxide	0.00	0.00
Nitrogen	0.00	0.00

Methane	0.00	0.00
Ethane	0.00	0.00
Propane	0.05	0.01
Iso-butane	0.00	0.00
n-butane	0.01	0.00
Iso-pentane	0.00	0.00
n-pentane	0.02	0.01
Hexanes	0.07	0.03
Heptanes Plus	99.83	99.95

Anticipated Properties of Flash Gas:

Gas Calculated Specific Gravity (Air=1)	.565
Gas Heat of Combustion (Btu/cuft@60F) Dry	1019
Gas Heat of Combustion (Btu/cuft@60F)Wet	1001
Gas Compressibility (@ 1atm & 60F) Z	.998

12. SPILL RESPONSE SITES

Primary Response Equipment Locations	Preplanned Staging Locations
Houma, Louisiana	Fourchon, Louisiana
Ft. Jackson, Louisiana	Venice, Louisiana

13. SPILL RESPONSE DISCUSSION FOR NEPA ANALYSIS

For the purpose of NEPA and Coastal Zone Management Act analysis, the largest spill response originating from Atwater Valley Blocks 305 and 349 would be a well on production estimated to be 391 BCPD plus 1 bbl BCPD from the pipeline, each with an API gravity of 43.17°.

The largest spill response originating from Mississippi Canyon Block 920 which includes tanks, flowlines and pipelines is estimated at 540 BCPD with an API gravity of 35^0.

Land Segment and Resource Identification

Trajectories of a spill and the probability of it impacting a land segment have been projected utilizing information in MMS Oil Spill Risk Analysis Model (OSRAM) for the Central and Western Gulf of Mexico available on MMS website. The results are shown in the Table, Trajectory by Land Segment.

The MMS OSRAM identifies a one percent probability of impact to the shorelines of Plaquemines Parish, Louisiana within 10 days from Atwater Valley Blocks 305 and 349 and a five percent probability of impact to Plaquemines Parish and one percent probability of impact to the shorelines of LaFourche Parish within 10 days from Mississippi Canyon Block 920. Plaquemines Parish includes the Delta National Wildlife Refuge and Pass-A-Loutre Wildlife Management Area. The Delta National Wildlife Refuge consists of 48,000 acres of marshlands and open water. It primarily provides a winter sanctuary for migratory waterfowl and is home to many other birds, deer and alligators. The Pass-A-Loutre Wildlife Management Area consists of

66,000 acres and is accessible by boat only. This area consists of river channels, bayous and man-made canals. It is home to nutria, muskrat, mink, raccoon and otters, alligators and freshwater and saltwater fish. The Wisner Wildlife Management Area is located in LaFourche Parish. This area contains 21,621 acres and access is by boat only. The Brown Pelican and Peregrine Falcon are the only endangered species present. Additional discussion of protection strategies for potentially affected resources is included in Anadarko's Regional Oil Spill Response Plan.

Anadarko will make every effort to respond to the Worst Case Discharge as effectively as possible. A description of the response equipment available to contain and recover the Worst Case Discharge is shown in the Table, Equipment Response Time.

This table outlines equipment, personnel, materials and support vessels as well as temporary storage equipment to be considered in order to cope with an initial spill of 9,000 bbls. The list estimates individual times needed for procurement, load out, travel time to the site and deployment. If appropriate, 5 sorties (10,000 gallons) from the DC-4 and 10 sorties (10,000 gallons) from the DC-3s should disperse approximately 8,570 barrels of oil.

Offshore response strategies may also include attempting to skim utilizing the CGA HOSS barge, four (4) Fast Response Units (FRUs), with the total derated skimming capacity of 56,600 barrels. Temporary storage associated with the identified skimming equipment equals 4,930 barrels. If additional temporary storage is needed, a temporary storage barge may be mobilized.

SAFETY IS ANADARKO'S FIRST PRIORITY. AIR MONITORING WILL BE INITIATED AND OPERATIONS DEEMED SAFE PRIOR TO ANY CLEANUP, CONTAINMENT, OR SKIMMING OPERATIONS.

If the spill went unabated, shoreline impact in coastal environments would depend upon existing environmental conditions. Onshore response may include the deployment of shoreline boom on beach areas, or protection and sorbent boom in vegetated areas. Strategies would be based upon surveillance and real time trajectories that depict areas of potential impact given actual sea and weather conditions. Strategies from the Southeast Louisiana Area Contingency Plans (ACP), and Unified Command would be consulted to ensure that environmental and special economic resources would be correctly identified and prioritized to ensure optimal protection. ACPs depict the protection response modes applicable for oil spill clean-up operations. Each response mode is schematically represented to show optimum deployment and operation of the equipment in areas of environmental concern. Supervisory personnel have the option to modify the deployment and operation of equipment allowing a more effective response to site-specific circumstances.

TRAJECTORY BY LAND SEGMENT

Trajectory of a spill and the probability of it impacting a land segment have been projected utilizing Anadarko Petroleum Corporation's WCD and information in MMS Oil Spill Risk Analysis Model (OSRAM) for the Central and Western Gulf of Mexico available on MMS website using ten (10) day impact. The results are tabulated below.

Area/Block	OCS-G	Launch Area	Land Segment and/or Resource	Conditional Probability (%) within 10 days
Completion & Production 110 miles from shore	18556 & 18557	C061	Plaquemines, LA	1
Installation and Production 90 miles from shore	MC 920	C059	Plaquemines, LA LaFourche, LA	5 1

WCD Scenario – Production– (90 miles from shore)

Equipment Response Time to: Mississippi Canyon Block 920

	EQUIPMENT TYPE	Derated Capacity (BBLS)	Storage (BBLS)	No. of Units	Owner/ Location	Initial Staging	Hours To Staging Area	TOTAL Time to Procure (1)	Time to Load Out (2)	Travel Time (Staging/ Spill) (3)	Time to Deploy (4)	TOTAL Estimated Response Time
A	DC 4 Spray Aircraft	--	--	1	ASI/HOUMA	HOUMA	0					
	DC 3 Spray Aircraft	--	--	1	ASI/HOUMA	HOUMA	0					
	Spotter Plane			1	ASI/HOUMA	HOUMA	0					
	Spotter Personnel			2	ASI/HOUMA	HOUMA	1	1	1	1	0	3
	Dispersant				CGA/HOUMA	HOUMA	0					
B	HOSS Barge	43,000	4,130	1	CGA/HOUMA	HOUMA	2	4	2	30	1	39
	Operators			12	STARS	HOUMA	2					
	Tugs			3	Vessel of Opportunity	HOUMA	4					
C	FRU/Expandi	6,800	400	2	CGA/Ft Jackson	VENICE	.5					
	Operators			12	STARS*	VENICE	2					
	Utility Boat			2	Vessel of Opportunity	VENICE	2	2	1	12	1	18
	Crew Boat			2	Vessel of Opportunity	VENICE	2					
D	FRU/Expandi	6,800	400	2	CGA/Pascagoula	PASCAGOULA						
	Operators			12	STARS*	PASCAGOULA	.5					3
	Utility Boat			2	Vessel of Opportunity	PASCAGOULA	2	2	1	10	1	16
	Crew Boat			2	Vessel of Opportunity	PASCAGOULA						
E	**INITIAL SUPPORT**											
	Spotter Helo	--	--	1	PHI/VENICE	SPILL SITE	1	1	--	1.5	--	3.5
	Surveillance Helo	--	--	1	PHI/VENICE	SPILL SITE	1	1	--	1.5	--	3.5
	Hand Held Radios	--	--		STARS*	VENICE CHARLES	1.5	1.5	--	1	--	4
	TOTAL	56,600	4,930									

*STARS contractor called out by MSRC

WCD Scenario – Production– **Based on a Single Well Blowout (110 miles from shore)**

Equipment Response Time to: Atwater Valley Blocks 305 and 349

	EQUIPMENT TYPE	Derated Capacity (BBLS)	Storage (BBLS)	No. of Units	Owner/ Location	Initial Staging	Hours To Staging Area	TOTAL Time to Procure (1)	Time to Load Out (2)	Travel Time (Staging/ Spill) (3)	Time to Deploy (4)	TOTAL Estimated Response Time
A	DC 4 Spray Aircraft	--	--	1	ASI/HOUMA	HOUMA	0					
	DC 3 Spray Aircraft	--	--	1	ASI/HOUMA	HOUMA	0					
	Spotter Plane			1	ASI/HOUMA	HOUMA	0					
	Spotter Personnel			2	ASI/HOUMA	HOUMA	1	1	1	1	0	3
	Dispersant				CGA/HOUMA	HOUMA	0					
B	HOSS Barge	43,000	4,130	1	CGA/HOUMA	HOUMA	2	4	2	30	1	39
	Operators			12	STARS	HOUMA	2					
	Tugs			3	Vessel of Opportunity	HOUMA	4					
C	FRU/Expandi	6,800	400	2	CGA/Ft Jackson	VENICE	.5					
	Operators			12	STARS*	VENICE	2					
	Utility Boat			2	Vessel of Opportunity	VENICE	2	2	1	12	1	18
	Crew Boat			2	Vessel of Opportunity	VENICE	2					
D	FRU/Expandi			2	CGA/Pascagoula	PASCAGOULA						
	Operators	6,800	400	12	STARS*	PASCAGOULA	.5					3
	Utility Boat			2	Vessel of Opportunity	PASCAGOULA	2	2	1	10	1	16
	Crew Boat			2	Vessel of Opportunity	PASCAGOULA						
E	**INITIAL SUPPORT**											
	Spotter Helo	--	--	1	PHI/VENICE	SPILL SITE	1	1	--	1.5	--	3.5
	Surveillance Helo	--	--	1	PHI/VENICE	SPILL SITE	1	1	--	1.5	--	3.5
	Hand Held Radios	--	--		STARS*	VENICE CHARLES	1.5	1.5	--	1	--	4
	TOTAL	56,600	4,930									

*STARS contractor called out by MSRC

14. POLLUTION PREVENTION MEASURES

Safety, pollution, and early spill detection measures are discussed in Section 6 of Anadarko's Regional OSRP.

APPENDIX G
AIR EMISSIONS INFORMATION

Screening Questions for DOCD's	Yes	No
Is any calculated Complex Total (CT) Emission amount (in tons) associated with your proposed exploration activities more than 90% of the amounts calculated using the following formulas: $CT = 3400D^{2/3}$ for CO, and $CT = 33.3D$ for the other air pollutants (where D = distance to shore in miles)?		No
Do your emission calculations include any emission reduction measures or modified emission factors?		No
Does or will the facility complex associated with your proposed development and production activities process production from eight or more wells?	Yes	
Do you expect to encounter H_xS at concentrations greater than 20 parts per million (ppm)?		No
Do you propose to flare or vent natural gas in excess of the criteria set forth under 250:1105(a)(2) and (3)?		No
Do you propose to burn produced hydrocarbon liquids?		No
Are your proposed development and production activities located within 25 miles from shore?		No
Are your proposed development and production activities located within 200 kilometers of the Breton Wilderness Area?		No

An Air Emissions Spreadsheet follows. Air emissions were calculated based on the following:

Year 2006: installation of lease term pipelines and Independence Hub beginning in April.

Year 2007: first production expected July 1, 2007.

Year 2008: first full year on production

GULF OF MEXICO AIR EMISSION CALCULATIONS
INSTRUCTIONS

General

This document (DOCD_AQ.XLS) was prepared through the cooperative efforts of those professionals in the oil industry including the API/OOC Gulf of Mexico Air Quality Task Force, and the Minerals Management service (MMS), who deal with air emission issues. This document is intended to standardize the way we estimate our potential air emissions for Development Operations Coordination Documents (DOCD) approved by the Minerals Management Service (MMS). It is intended to be thorough but flexible to meet the needs of different operators. This first file gives the basis for the emission factors used in the emission spreadsheet as well as some general instructions.
The following files, Title Sheet, Factors Sheet,Emissions Spreadsheet,and Summary Sheet will describe and calculate emissions from an activity.

Title Sheet

The Title Sheet requires input of the company's name, area, block, OCS-G number, platform and/or well(s) in the necessary lines. This data will automatically be transferred to the spreadsheet and summary sheet.

Factor Sheet

The emission factors were compiled from the latest AP-42 references or from industry studies if no AP-42 reference was available. Factors can be revised as more data becomes available. A change to this Factor Sheet will be automatically changed in Emission Spreadsheet. A sulfur content table was added in 1996. A change in this table will automatically revise the SOx factor which will revise emissions.

The basis for the factors is as follows:

1. NG Turbines — Fuel usage scf/hr = HP X 9.524 (10,000 btu/HP-hr / 1050 btu/scf)
2. NG Engines — Fuel usage scf/hr = HP X 7.143 (7,500 btu/HP-hr / 1050 btu/scf)
3. Diesel — Fuel usage gals/hr = HP X 0.0483 (7,000 btu/HP-hr / 145,000 btu/gal)

Emission Factors

Natural Gas Prime Movers

1. TNMOC refers to total non-methane organic carbon emissions and these can be assumed equivalent to VOC emissions.

2. The sulfur content assumed is 2000 grains /mmscf (3.33 ppm). If your concentration is different then revise the ppm in the sulfur able immediately below the factors table.

Diesel-Fired Prime Movers

1. Diesel sulfur level 0.4% by wt. If your sulfur content is different change % wt. in the sulfur table.

2. For boats use > 600 HP factors based on AP-42 Vol. II, Table II-3-3. Those figures closely match the above values. Include the emissions from all vessels associated with your activities for their time of operation within a 25 mile radius of your facility.

3. For diesel engines <600 HP VOC emissions equal total HC emissions; for diesel engines>600 HP VOC emissions equal non-methane HC emissions.

Heaters/Boilers/Firetubes/NG-Fired

1. The assumed NG Sulfur content is 2000 gr. per mcf(3.33 ppm). You may revise the sulfur content by changing the ppm in the sulfur table, if your content is different.

2. The VOCs emissions are based on total non-methane HCs.

Gas Flares

1. It is assumed that the flare is non-smoking.

2. A heating value of 1050 btu/cu. ft. for NG is assumed.

3. The sulfur content assumed is 2000 grains /mmscf (3.33 ppm). If your concentration is different then revise the ppm in the sulfur table, or you may use the following formula:

   H2S flared (lbs/hr) = Gas flared (cu ft/hr) X ppm H2S X 34/(379X1000000)

   SOx emis (lbs/hr) = H2S flared (lbs/hr) X 64/34

Liquid Flares

1. Assumes 1% by wt Sulfur maximum in the crude oil. Revise the percent sulfur in the sulfur table if your value is different.

2. VOCs equal non-methane HCs

3. Particulate emissions assumes Grade 5 oil.

Tanks

1. Tank emissions assumes uncontrolled fixed roof tank.

2. The EPA TANKS model is an acceptable alternative. If you use TANKS you must provide sufficient information for MMS to verify your results.

Fugitives

1. Fugitives are based on the 1995 Star Environmental Report. It requires that you count or estimate your components.The factor is based on average leak rate for light oil / gas facility.

Glycol Dehydrator Vent

1. The rate of the gas being dehydrated (throughput) in SCF/HR must be entered in the spreadsheet. The emission factor is from the compilation of the Louisiana Survey and an average emissions per gas rate.

Gas Venting

1.The emission factor is based on venting unburned natural gas of average weight.

Emissions Spreadsheets (EMISSIONS1 through EMISSIONS5)

The emissions from an operation should be presented for a calendar year (1999, 2000, etc.). The operation may include production only or production in conjunction with other activities such as drilling or construction operations. For additional years the Emissions Spreadsheet is renamed Emissions 2, 3, etc. The different operating parameters for each year should entered to calculate revised emissions for that year. The spreadsheet will calculate maximum fuel usage (UNIT/HR) using the known horsepower. It will assume maximum fuel usage is equal to actual fuel (UNIT/DAY) usage unless the actual fuel usage is known. If so, insert actual fuel usage in appropriate column. The emissions will be calculated as follows:

Emission rate (lb/hr) = (HP or fuel rate) X Emission Factor (Potential to emit)

Emissions (tpy)=Emission rate (lb/hr) X load factor(Act Fuel/Max Fuel) X hrsX daysX ton/2000 lbs (Actual emissions)

To customize the spreadsheet for your application it is possible to delete lines for non-applicable

Also, the production equipment can be customized further by adding the use of the equipment behind each type of engine, i.e.,

Turbine
Turbine - Gas Compressor

Burner
Burner - Line Heater

Summary Sheet

The Summary Sheet is designed to show a proposed estimate of emissions from an activity over a future period of time. In this example ten years was chosen. The first line (Row 7) of the summary sheet is linked to the yearly totals in the Emissions1 Spreadsheet. The second line (Row 8) is referenced to Emissions2 Spreadsheet. The third line (Row 9) is referenced to Emissions3, Row 10 to Emissions 4, Row 11 to Emissions 5. If more years of calculations are necessary to reach a constant then a spreadsheet can be copied and linked to the summary sheet for future years. Once emissions are constant the values are carried to the end of the ten year period.

The **Paperwork Reduction Act of 1995** (44 U.S.C. Chapter 35) requires us to inform you that MMS collects this information as part of an applicant's DOCD submitted for MMS approval. We use the information to facilitate our review and data entry for OCS plans. We will protect proprietary data according to the Freedom of Information Act and 30 CFR 250.196. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid Office of Management and Budget (OMB) control number. Responses are mandatory. The reporting burden for this form is included in the burden for preparing DOCDs. We estimate that burden to average 580 hours per response, including the time for reviewing instructions, gathering and maintaining the data, and completing and reviewing the form. Direct comments on the burden estimate or any other aspect of this form to the Information Collection Clearance Office, Mail Stop 4230, Minerals Management Service, 1849 C Street, N. W., Washington, DC 20240.

DOCD AIR QUALITY SCREENING CHECKLIST

OMB Control No. 1010-0049
OMB Approval Expires: September 30, 2003

COMPANY	Anadarko Petroleum Corporation
AREA	Atwater Valley
BLOCK	305/349
LEASE	G18566/18577
PLATFORM	MC 920 "A"
WELL	
COMPANY CONTACT	Judy Davidson
TELEPHONE NO.	832-636-8766
REMARKS	Install Platform A and place 4 wells on production

LEASE TERM PIPELINE CONSTRUCTION INFORMATION:		
YEAR	NUMBER OF PIPELINES	TOTAL NUMBER OF CONSTRUCTION DAYS
2005		
2006	7	15
2007		
2008		
2009		

AIR EMISSION CUMPUTATION FACTORS

Fuel Usage Conversion Factors	Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engine		REF.	DATE
	SCF/hp-hr	9.524	SCF/hp-hr	7.143	GAL/hp-hr	0.0483	AP42 3.2-1	4/76 & 8/84

Equipment/Emission Factors	units	PM	SOx	NOx	VOC	CO	REF.	DATE
NG Turbines	gms/hp-hr		0.00247	1.3	0.01	0.83	AP42 3.2-1& 3.1-1	10/96
NG 2-cycle lean	gms/hp-hr		0.00185	10.9	0.43	1.5	AP42 3.2-1	10/96
NG 4-cycle lean	gms/hp-hr		0.00185	11.8	0.72	1.6	AP42 3.2-1	10/96
NG 4-cycle rich	gms/hp-hr		0.00185	10	0.14	8.6	AP42 3.2-1	10/96
Diesel Recip. < 600 hp.	gms/hp-hr	1	1.468	14	1.12	3.03	AP42 3.3-1	10/96
Diesel Recip. > 600 hp.	gms/hp-hr	0.32	1.468	11	0.33	2.4	AP42 3.4-1	10/96
Diesel Boiler	lbs/bbl	0.084	2.42	0.84	0.008	0.21	AP42 1.3-12,14	9/98
NG Heaters/Boilers/Burners	lbs/mmscf	7.6	0.593	100	5.5	84	P42 1.4-1, 14-2, & 14	7/98
NG Flares	lbs/mmscf		0.593	71.4	60.3	388.5	AP42 11.5-1	9/91
Liquid Flaring	lbs/bbl	0.42	6.83	2	0.01	0.21	AP42 1.3-1 & 1.3-3	9/98
Tank Vapors	lbs/bbl				0		E&P Forum	1/93
Fugitives	lbs/hr/comp.				0.0005		API Study	12/93
Glycol Still Vent W/Cond. & VRU	lbs/mmscf				0		La. DEQ	1991
Gas Venting	lbs/scf				0.0034			

Sulfur Content Source	Value	Units
Fuel Gas	3.33	ppm
Diesel Fuel	0.4	% weight
Produced Gas(Flares)	3.33	ppm
Produced Oil (Liquid Flaring)	1	% weight

AIR EMISSION CALCULATIONS - FIRST YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL		CONTACT			PHONE	REMARKS					
Anadarko Petroleum Com	Atwater Valley	305/349	G18566/18577	MC 920 "A"				Judy Davidson		832-636-8766	#REF!					
OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
PIPELINE	LAY BARGE (DCV Balder) diesel	54300	2622.69	62944.56	24	15	38.27	175.58	1315.64	39.47	287.05	6.89	31.60	236.81	7.10	51.67
INSTALLATION	SUPPORT VESSEL diesel	3600	173.88	4173.12	24	15	2.54	11.64	87.22	2.62	19.03	0.46	2.10	15.70	0.47	3.43
Lease Term 7 Lines	PIPELINE BURY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AT 305/349	SUPPORT VESSEL diesel	3600	173.88	4173.12	24	3	2.54	11.64	87.22	2.62	19.03	0.09	0.42	3.14	0.09	0.69
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY	LAY BARGE (DCV Balder) diesel	54300	2622.69	62944.56	24	45	38.27	175.58	1315.64	39.47	287.05	20.67	94.81	710.44	21.31	155.01
INSTALLATION	MATERIAL TUG diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	19400	937.02	22488.48	24	55	13.67	62.73	470.04	14.10	102.56	9.02	41.40	310.23	9.31	67.69
	VESSELS>600hp position tug	12000	579.6	13910.40	24	9	8.46	38.80	290.75	8.72	63.44	0.91	4.19	31.40	0.94	6.85
	VESSELS>600hp position tug	12000	579.6	13910.40	24	9	8.46	38.80	290.75	8.72	63.44	0.91	4.19	31.40	0.94	6.85
	VESSELS>600hp position tug	12000	579.6	13910.40	24	9	8.46	38.80	290.75	8.72	63.44	0.91	4.19	31.40	0.94	6.85
	VESSELS>600hp diesel(supply)	6000	289.8	6955.20	24	3	4.23	19.40	145.37	4.36	31.72	0.15	0.70	5.23	0.16	1.14
	VESSELS>600hp tug barge piles	6000	289.8	6955.20	24	2	4.23	19.40	145.37	4.36	31.72	0.10	0.47	3.49	0.10	0.76
	VESSELS>600hp tug mooring	6000	289.8	6955.20	24	2	4.23	19.40	145.37	4.36	31.72	0.10	0.47	3.49	0.10	0.76
	VESSELS>600hp tug mooring	6000	289.8	6955.20	24	2	4.23	19.40	145.37	4.36	31.72	0.10	0.47	3.49	0.10	0.76
2006	YEAR TOTAL						**137.59**	**631.18**	**4729.52**	**141.89**	**1031.89**	**40.33**	**185.00**	**1386.23**	**41.59**	**302.45**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**											**2997.00**	**2997.00**	**2997.00**	**2997.00**	**68282.16**
	90.0															

AIR EMISSIONS CALCULATIONS - SECOND YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL		CONTACT			PHONE	REMARKS					
Anadarko Petroleum Co	Atwater Valley	305/349	G18566/18577	MC 920 "A"				Judy Davidson		832-636-8766	#REF!					
OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
PRODUCTION	RECIP.<600hp diesel (Crane)	490	23.667	568.01	2	117	1.08	1.58	15.11	1.21	3.27	0.13	0.19	1.77	0.14	0.38
	RECIP.<600hp diesel (Crane)	490	23.667	568.01	2	117	1.08	1.58	15.11	1.21	3.27	0.13	0.19	1.77	0.14	0.38
	RECIP.<600hp diesel (Fire Pump)	420	20.286	486.86	1	26	0.93	1.36	12.95	1.04	2.80	0.01	0.02	0.17	0.01	0.04
	RECIP.<600hp diesel (Fire Pump)	420	20.286	486.86	1	26	0.93	1.36	12.95	1.04	2.80	0.01	0.02	0.17	0.01	0.04
	RECIP.>600hp diesel (Aux Gen)	1316	63.5628	1525.51	24	12	0.93	4.26	31.89	0.96	6.96	0.13	0.61	4.59	0.14	1.00
	RECIP.>600hp diesel (Emer Gen)	843	40.7169	977.21	24	12	0.59	2.73	20.43	0.61	4.46	0.09	0.39	2.94	0.09	0.64
	SUPPORT VESSEL diesel	3600	173.88	4173.12	18	26	2.54	11.64	87.22	2.62	19.03	0.59	2.72	20.41	0.61	4.45
	TURBINE nat gas	12362	117735.688	2825656.51	24	183		0.07	35.40	0.27	22.60		0.15	77.73	0.60	49.63
	TURBINE nat gas	12362	117735.688	2825656.51	24	183		0.07	35.40	0.27	22.60		0.15	77.73	0.60	49.63
	TURBINE nat gas	12362	117735.688	2825656.51	24	183		0.07	35.40	0.27	22.60		0.15	77.73	0.60	49.63
	TURBINE nat gas	12362	117735.688	2825656.51	24	183		0.07	35.40	0.27	22.60		0.15	77.73	0.60	49.63
	TURBINE nat gas	12362	117735.688	2825656.51	24	183		0.07	35.40	0.27	22.60		0.15	77.73	0.60	49.63
	TURBINE electrical generator	7700	73334.8	1760035.20	24	183		0.04	22.05	0.17	14.08		0.09	48.42	0.37	30.91
	TURBINE electrical generator	7700	73334.8	1760035.20	24	183		0.04	22.05	0.17	14.08		0.09	48.42	0.37	30.91
	TURBINE electrical generator	7700	73334.8	1760035.20	24	183		0.04	22.05	0.17	14.08		0.09	48.42	0.37	30.91
	RECIP.2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	BURNER nat gas	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MISC.	BPD	SCF/HR	COUNT												
	Tank w/VRU	0			0	0				0.00					0.00	
	FLARE- (3 pilots @ 100 SCFH)		35,416,700		24	6		21.00	2528.75	2135.63	13759.39		1.51	182.07	153.77	990.68
	PROCESS VENT-		0		0	0				0.00					0.00	
	FUGITIVES-			106.0		183				0.05					0.12	
	GLYCOL Still Vent W/Cond&VRU		35,416,700		24	183				0.00					0.00	
DRILLING	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
2007	YEAR TOTAL						8.07	45.97	2967.55	2146.23	13957.21	1.09	6.66	747.81	159.14	1338.50
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											2997.00	2997.00	2997.00	2997.00	68282.16
	90.0															

AIR EMISSIONS CALCULATIONS - THIRD YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL	CONTACT	PHONE	REMARKS
Anadarko Petroleum Co	Atwater Valley	305/349	G18566/18577	MC 920 "A"		Judy Davidson	832-636-8766	#REF!

OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
PRODUCTION	RECIP.<600hp diesel (Crane)	490	23.667	568.01	2	156	1.08	1.58	15.11	1.21	3.27	0.17	0.25	2.36	0.19	0.51
	RECIP.<600hp diesel (Crane)	490	23.667	568.01	2	156	1.08	1.58	15.11	1.21	3.27	0.17	0.25	2.36	0.19	0.51
	RECIP.<600hp diesel (Fire Pump)	420	20.286	486.86	1	52	0.93	1.36	12.95	1.04	2.80	0.02	0.04	0.34	0.03	0.07
	RECIP.<600hp diesel (Fire Pump)	420	20.286	486.86	1	52	0.93	1.36	12.95	1.04	2.80	0.02	0.04	0.34	0.03	0.07
	RECIP.>600hp diesel (Aux Gen)	1316	63.5628	1525.51	24	15	0.93	4.26	31.89	0.96	6.96	0.17	0.77	5.74	0.17	1.25
	RECIP.>600hp diesel (Emer Gen)	843	40.7169	977.21	24	15	0.59	2.73	20.43	0.61	4.46	0.11	0.49	3.68	0.11	0.80
	SUPPORT VESSEL diesel	3600	173.88	4173.12	18	52	2.54	11.64	87.22	2.62	19.03	1.19	5.46	40.93	1.23	8.93
	TURBINE nat gas	12362	117735.688	2825656.51	24	365		0.07	35.40	0.27	22.60		0.29	155.04	1.19	98.99
	TURBINE nat gas	12362	117735.688	2825656.51	24	365		0.07	35.40	0.27	22.60		0.29	155.04	1.19	98.99
	TURBINE nat gas	12362	117735.688	2825656.51	24	365		0.07	35.40	0.27	22.60		0.29	155.04	1.19	98.99
	TURBINE nat gas	12362	117735.688	2825656.51	24	365		0.07	35.40	0.27	22.60		0.29	155.04	1.19	98.99
	TURBINE nat gas	12362	117735.688	2825656.51	24	365		0.07	35.40	0.27	22.60		0.29	155.04	1.19	98.99
	TURBINE nat gas	7700	73334.8	1760035.20	24	365		0.04	22.05	0.17	14.08		0.18	96.57	0.74	61.66
	TURBINE nat gas	7700	73334.8	1760035.20	24	365		0.04	22.05	0.17	14.08		0.18	96.57	0.74	61.66
	TURBINE nat gas	7700	73334.8	1760035.20	24	365		0.04	22.05	0.17	14.08		0.18	96.57	0.74	61.66
	RECIP.2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	BURNER nat gas	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MISC.	BPD	SCF/HR	COUNT												
	Tank W/VRU	0			0	0				0.00					0.00	
	FLARE-		35,416,700		24	12		21.00	2528.75	2135.63	13759.39		3.02	364.14	307.53	1981.35
	PROCESS VENT-		0		0	0				0.00					0.00	
	FUGITIVES-			106.0		365				0.05					0.23	
	Glycol Still Vent W/Cond. & VRU		35,416,700		24	12				0.00					0.00	
DRILLING	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
2008	YEAR TOTAL						8.07	45.97	2967.55	2146.23	13957.21	1.85	12.33	1484.80	317.90	2673.42
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											2997.00	2997.00	2997.00	2997.00	68282.16
	90.0															

AIR EMISSION CALCULATIONS

OMB Control No. xxxx-xxxx
Expiration Date: Pending

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL
Anadarko Petrol	Atwater Valley	305/349	G18566/18577	MC 920 "A"	

Year	Emitted Substance				
	PM	SOx	NOx	VOC	CO
2006	40.33	185.00	1386.23	41.59	302.45
2007	1.09	6.66	747.81	159.14	1338.50
2008	1.85	12.33	1484.80	317.90	2673.42
2009	1.85	12.33	1484.80	317.90	2673.42
2010	1.85	12.33	1484.80	317.90	2673.42
2011	1.85	12.33	1484.80	317.90	2673.42
2012	1.85	12.33	1484.80	317.90	2673.42
2013	1.85	12.33	1484.80	317.90	2673.42
2014	1.85	12.33	1484.80	317.90	2673.42
2015	1.85	12.33	1484.80	317.90	2673.42
Allowable	2997.00	2997.00	2997.00	2997.00	68282.16

APPENDIX H
ENVIRONMENTAL IMPACT ANALYSIS

Environmental Impact Analysis

JOINT INITIAL
DEVELOPMENT OPERATIONS
COORDINATION DOCUMENT
Atwater Valley Area
Block 305 (OCS-G 18556)
Block 349 (OCS-G 18577)

March 2005

Prepared for:

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A. IMPACT-PRODUCING FACTORS

This Environmental Impact Analysis (EIA) evaluates development activities by Anadarko Petroleum Corporation in Atwater Valley (AT) Blocks 305 and 349. Anadarko plans to place AT 349 Well No. 2, proposed AT 349 Well No. 3, and proposed AT 305 Wells No. 1 and 2 in production. Right-of-way pipelines will be installed to transport production from AT 349 and AT 305 to Anadarko's proposed Independence Hub in Mississippi Canyon (MC) Block 920, a distance of approximately 30 miles. Lease-term pipelines (jumpers) in AT 305 and AT 349 will be installed to transport production from the wells to the right-of-way pipelines.

The Independence Hub will be a column-based semi-submersible hull structure that will process production from deepwater subsea tie-ins. The structure will be affixed to the seafloor in MC 920 by 12 suction pilings and will accommodate up to 16 right-of-way pipelines from subsea wells, and a 20-inch export pipeline. Initially, there will be six subsea tie-backs and one export gas pipeline.

The general schedule is given in **Appendix A** of the Joint Initial Development Operations Coordination Document (DOCD). Right-of-way pipeline installation is planned to start in December 2005. Installation of lease-term pipelines and the Independence Hub is planned to begin in October 2006. Hookup and commencement of production are planned for July 2007. Dates are tentative, and some activities overlap other activities.

This EIA covers impacts of installing lease-term pipelines in AT 305 and 349 and installing and operating the Independence Hub. It does not include drilling and/or completion of wells, which will be done under the previously approved Initial Exploration Plan. Right-of-way pipelines will be permitted under separate pipeline applications.

AT 305 and 349 are approximately 110 miles southeast of the Mississippi River Delta off the coast of Louisiana and approximately 180 miles south of Mobile Bay, Alabama. The leases are 150 miles from the primary support base in Port Fourchon, Louisiana. Water depth at the Atwater Valley location is approximately 2,713 m (8,900 ft). The Independence Hub location in MC 920 is in a water depth of about 2,438 m (8,000 ft), 90 miles southeast of the Louisiana coastline, and 150 miles from the Alabama coast.

Table 1 is a matrix of impact-producing factors (IPFs) and potentially affected environmental resources. The table is based on the matrix provided by the Minerals Management Service (MMS) at
http://www.gomr.mms.gov/homepg/regulate/regs/ntls/EIAWorksheet.pdf.

An "X" in a particular table cell indicates that an IPF could affect a certain resource, and a dash (--) indicates no impact or negligible impact. Where there may be an effect, an analysis is provided in **EIA Section B**. For completeness, an "X" has been placed in the Accidents column for various coastal and other resources indicating potential impact, even though the detailed analysis indicates contact with spilled oil is unlikely. In accordance with MMS requirements, for those cells that are footnoted, a statement has been provided after the table as to the applicability of the proposed operations.

Table 1. Matrix of impact-producing factors and environmental resources.

Environmental Resources	Impact-Producing Factors						
	Physical Disturbances to the Seafloor	Hub Presence	Air Emissions	Effluent Discharges	Marine Trash and Debris	Support Operations	Accidents
Site-Specific at Offshore Location							
Designated topographic features	--(1)	--	--	--(1)	--	--	--(1)
Pinnacle Trend area live bottoms	--(2)	--	--	--(2)	--	--	--(2)
Eastern Gulf live bottoms	--(3)	--	--	--(3)	--	--	--(3)
Chemosynthetic communities	--(4)	--	--	--	--	--	--
Water quality	--	--	--	X	--	X	X
Fisheries	--	X	--	--	--	--	X
Marine mammals	--	X(8)	--	--	X	X	X(8)
Sea turtles	--	X(8)	--	--	X	X	X(8)
Air quality	--	--	X(9)	--	--	X	X
Shipwreck sites (known/potential)	--(7)	--	--	--	--	--	--
Prehistoric archaeological sites	--(7)	--	--	--	--	--	--
Vicinity of Offshore Location							
Essential fish habitat	--	X	--	X	--	--	X(6)
Marine and pelagic birds	--	X	--	--	X	--	X
Public health and safety	--	--	--	--	--	--	--(5)
Coastal and Onshore							
Beaches	--	--	--	--	--	--	X(6)
Wetlands	--	--	--	--	--	--	X(6)
Shore birds & coastal nesting birds	--	--	--	--	--	X	X(6)
Coastal wildlife refuges	--	--	--	--	--	--	X(6)
Wilderness areas	--	--	--	--	--	--	X(6)
Other Resources							
Benthic communities	X	--	--	--	--	--	--
Pelagic communities	--	X	--	X	--	--	X
Gulf sturgeon (threatened fish)	--	--	--	--	--	--	--
Endangered beach mice	--	--	--	--	--	--	--
Economics and demographics	--	--	--	--	--	--	--
Land use	--	--	--	--	--	--	--
Recreation and tourism	--	--	--	--	--	--	--

Table Footnotes and Applicability:

(1) *Activities that may affect a marine sanctuary or topographic feature. Specifically, if the well or platform site or any anchors will be on the seafloor within the*
   (a) *4-mile zone of the Flower Garden Banks, or the 3-mile zone of Stetson Bank;*
   (b) *1,000-m, 1-mile, or 3-mile zone of any topographic feature (submarine bank) protected by the Topographic Features stipulation attached to an outer continental shelf (OCS) lease;*
   (c) *Essential Fish Habitat (EFH) criteria of 500 ft from any no-activity zone; or*
   (d) *Proximity of any submarine bank (500-ft buffer zone) with relief greater than 2 m that is not protected by the Topographic Features stipulation attached to an OCS lease.*

- This footnote is not applicable. The lease area is not within or near the stated distances of any topographic feature or no-activity zone. The geohazards evaluation indicates no submarine banks in the lease areas.

(2) *Activities with any bottom disturbance within an OCS lease block protected through the Live Bottom (Pinnacle Trend) stipulation attached to an OCS lease.*

- The lease area is not covered by the Live Bottom (Pinnacle Trend) stipulation. The geohazards evaluation indicates no hard bottom features in the lease area.

(3) *Activities within any Eastern Gulf OCS block where seafloor habitats are protected by the Live Bottom (Low-Relief) stipulation attached to an OCS lease.*

- The Live Bottom (Low-Relief) stipulation applies to Eastern Planning Area leases in water depths of 100 m or less; therefore, the leases are not covered by this stipulation.

(4) *Activities on blocks designated by the MMS as being in water depths 400 m or greater.*

- The lease area is located in water depths of 400 m or greater. However, the chemosynthetic community evaluation indicates that the potential for significant chemosynthetic communities is very low. No impacts on chemosynthetic communities are anticipated.

(5) *Exploration or production activities where H_2S concentrations greater than 500 ppm might be encountered.*

- This footnote is not applicable because MMS determined AT 305 and 349 to be "H_2S absent" by letter dated 21 October 2002.

(6) *All activities that could result in an accidental spill of produced liquid hydrocarbons or diesel fuel that you determine would impact these environmental resources. If the proposed action is located a sufficient distance from a resource that no impact would occur, the EIA can note that in a sentence or two.*

- Accidental hydrocarbon spills could affect the resources marked (X) in the matrix, and impacts are analyzed in **EIA Section B**. Due to the distance from shore, the anticipated spill weathering characteristics, and spill response measures, impacts on beaches, wetlands, shore birds and coastal nesting birds, and other coastal resources are considered highly unlikely.

(7) *All activities that involve seafloor disturbances, including anchor emplacements, in any OCS block designated by the MMS as having high-probability for the occurrence of shipwrecks or prehistoric sites, including such blocks that will be affected that are adjacent to the lease block in which your planned activity will occur. If the proposed activities are located a sufficient distance from a shipwreck or prehistoric site that no impact would occur, the EIA can note that in a sentence or two.*

- AT 305, AT 349, and MC 920 are not on the MMS list of blocks determined to have a high probability of archaeological resources. Therefore, no impacts on archaeological resources are expected.

(8) *All activities that you determine might have an adverse effect on endangered or threatened marine mammals or sea turtles or their critical habitats.*

- IPFs that may affect marine mammals, sea turtles, or their critical habitats include marine trash and debris, support operations, and accidents (oil spills). Impacts are analyzed in **EIA Section B**.

(9) *Production activities that involve transportation of produced fluids to shore using shuttle tankers or barges.*

- This footnote is not applicable (no transportation of produced fluids to shore using shuttle tankers or barges).

IPFs applicable to the proposed activity include physical disturbances to the seafloor, hub presence, air emissions, effluent discharges, marine trash and debris, support operations, and accidents.

A.1 PHYSICAL DISTURBANCES TO THE SEAFLOOR

The seafloor will be disturbed by the installation of subsea facilities. In AT 305 and 349, these will include lease-term pipelines and umbilicals as well as a manifold and subsea wellheads. A dynamically positioned lay barge would be used to install pipelines using the J-lay method, and therefore there would be no anchoring. In MC 920, a small area of seafloor would be disturbed by the 12 suction pilings used to moor the Independence Hub. It is assumed that the total area of seafloor disturbance will be a few hectares.

A.2 HUB PRESENCE

The Independence Hub will be a column-based semi-submersible type hull structure. The Hub will attract epipelagic fishes such as tunas, dolphin, billfishes, and jacks, which are commonly attracted to fixed and drifting surface structures (e.g., Holland et al., 1990; Higashi, 1994; Relini et al., 1994).

A.3 AIR EMISSIONS

DOCD Appendix G provides the Projected Air Quality Emissions Report prepared in accordance with MMS requirements. Included are emissions from vessels (lay barge, tugs, support vessels) that will install lease-term pipelines and the Independence Hub, as well as emissions from the Independence Hub during routine production operations.

A.4 EFFLUENT DISCHARGES

DOCD Appendix E summarizes wastes including quantities and methods of disposal. All offshore discharges will be in accordance with the National Pollutant Discharge Elimination System (NPDES) general permit issued by the U.S. Environmental Protection Agency (USEPA).

A.5 MARINE TRASH AND DEBRIS

Solid waste is not expected to exceed 5 m^3 per month. Trash will be transported to shore and disposed of according to applicable regulations. Anadarko will adhere to MARPOL Annex V requirements, USEPA and U.S. Coast Guard (USCG) regulations, and MMS regulations and Notices to Lessees (NTLs) regarding solid wastes. MMS regulations prohibit operators from discharging containers and other similar materials (i.e., trash and debris) into the marine environment, and require durable identification markings on equipment, tools and containers (especially drums), and other material. USCG and USEPA regulations require that operators become proactive in avoiding accidental loss of solid waste items by developing waste management plans, posting informational placards, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. MMS NTL 2003-G11 instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires posting of placards at prominent locations on offshore vessels and structures, and requires a marine trash and debris awareness training and certification process.

A.6 SUPPORT OPERATIONS

Anadarko will use two existing support bases in Louisiana. Port Fourchon will serve as the primary base for supplies and crews for development operations. This base is located 150 miles from the project area. Venice, located 160 miles from the project area, will be used as a backup base. Helicopters will be dispatched from Galliano, Louisiana. Expected travel frequency is listed below:

Support Vessel	Completion Operations	Production
Crew Boat	3/week	1/week
Supply Boat	2/week	1/week
Helicopter	7/week	3/week

A.7 ACCIDENTS

Under "Accidents," an H_2S release was not considered as an IPF because MMS determined AT 305 and 349 to be "H_2S absent" by letter dated 21 October 2002. Only oil spills and chemical spills are considered.

Historical data suggest that a large spill is unlikely to occur as a result of well completion activities or hydrocarbon production associated with the project (Anderson and LaBelle, 2000; MMS, 2002). For impact analysis, a large oil spill was represented by the Worst Case Discharge (WCD), calculated in the DOCD as 9,000 barrels of condensate from a well blowout.

The Oil Spill Risk Analysis (OSRA) report by Ji et al. (2004) presents conditional probabilities of a spill contacting various shoreline segments. The results for Launch Area 61 (where AT 305 and 349 are located) and Launch Area 59 (where MC 920 is located) are presented in **Table 2**. There is no expected contact with any shorelines within 3 days, and the only potential shoreline contacts within 10 days are Plaquemines Parish, Louisiana (1 percent and 5 percent for a spill in AT 305/349 and MC 920, respectively) and LaFourche Parish, Louisiana (1 percent for a spill in MC 920). Because of weathering and spill response measures, a spill is unlikely to persist long enough to reach any shorelines. The impact analysis assumes that significant quantities of spilled hydrocarbons would not reach coastal areas.

Table 2. Conditional probabilities of a spill at the project area contacting shoreline segments, based on Oil Spill Risk Analysis (From: Ji et al., 2004). Values are probabilities (percent) that a hypothetical spill starting at AT 305/349 (represented by Launch Area 61) or MC 920 (represented by Launch Area 59) could contact shoreline segments within 3 or 10 days. Only segments with one or more non-zero values are listed.

Shoreline Segment	County or Parish and State	Conditional Probability of Contact[a]	
		3 days	10 days
Launch Area 61 (representing AT 305/349)			
C20	Plaquemines, LA	--	1
Launch Area 59 (representing MC 920)			
C18	LaFourche, LA	--	1
C20	Plaquemines, LA	--	5

[a] Conditional probability refers to the probability of contact within the stated time period, assuming that a spill has occurred (-- indicates less than 0.5 percent).

B. ANALYSIS

B.1 SITE-SPECIFIC AT OFFSHORE LOCATION

B.1.1 Designated Topographic Features

(a) Routine Operations

There are no IPFs associated with routine operations that could cause impacts to designated topographic features. The lease area is not in or near an MMS-designated topographic feature or no-activity zone. The geohazards evaluation indicates no submarine banks in the leases.

(b) Accidents

The nearest designated topographic feature is Sackett Bank, which is over 100 km from the project area. The Flower Garden Banks are over 500 km away. Due to the spill weathering and response efforts, a spill would be unlikely to reach the vicinity of any topographic feature. Further, since the crests of designated topographic features in the northern Gulf are at least 10 m below the sea surface, concentrated oil would not be expected to reach their sessile biota. No impacts would be expected.

B.1.2 Pinnacle Trend Area Live Bottoms

(a) Routine Operations

There are no IPFs associated with routine operations that could cause impacts to pinnacle trend live bottoms. The leases are not covered by the Live Bottom (Pinnacle Trend) stipulation. The geohazards evaluation indicates no hard bottom features in the lease area.

(b) Accidents

The pinnacle trend is along the shelf edge, about 150 km inshore of the lease area. Due to spill weathering and response efforts, a spill would be unlikely to reach the vicinity of the pinnacle trend area. Further, since the crests of pinnacle features are more than 50 m below the sea surface, concentrated oil would not be expected to reach their sessile biota. No impacts would be expected.

B.1.3 Eastern Gulf Live Bottoms

(a) Routine Operations

There are no IPFs associated with routine operations that could cause impacts to low-relief Eastern Gulf live bottoms. The Live Bottom (Low-Relief) stipulation applies to Eastern Planning Area leases in water depths of 100 m or less. The leases are not covered by this stipulation. The geohazards evaluation indicates no hard bottom features in the lease area.

(b) Accidents

The nearest live bottom areas as defined by MMS stipulation are inshore of the 100-m isobath, about 200 km from the project area. Because these are low-relief features on the seafloor, concentrated oil would not be expected to reach their sessile biota. No impacts would be expected.

B.1.4 Chemosynthetic Communities

(a) Routine Operations

There are no routine IPFs likely to cause impacts to chemosynthetic communities. There are no known chemosynthetic areas associated with AT 305 and 349. The shallow hazards report indicates that the area is clear of chemosynthetic communities. The seafloor appears to be void of geologic features that could support high-density chemosynthetic communities.

(b) Accidents

It is possible that undiscovered chemosynthetic communities exist in nearby deepwater lease blocks. However, a surface oil spill in the deepwater environment would not affect benthic communities, and a subsurface spill (e.g., a blowout) would be unlikely to affect benthic communities beyond a few hundred meters from the wellsite. Therefore, no impacts on chemosynthetic communities are likely.

B.1.5 Water Quality

(a) Routine Operations

Routine IPFs potentially affecting water quality include

- Effluent discharges; and
- Support operations.

Effluent Discharges. Effluent discharges affecting water quality include produced water, sanitary and domestic wastes, deck drainage, uncontaminated freshwater or seawater, desalination brine, uncontaminated ballast and bilge water, and miscellaneous discharges.

Produced water can have high total suspended solids, salinities, levels of organic carbon, metal content, and can be very low in dissolved oxygen (Neff, 1987). Because these waters are closely intermingled with petroleum, they contain variable concentrations of hydrocarbons, which are required to be separated before discharge. Produced water discharges in accordance with NPDES permit requirements are expected to be diluted rapidly, resulting in minor, localized changes in water quality parameters.

Sanitary and domestic wastes will have a slight effect on water quality in the immediate vicinity of these discharges. Sanitary and domestic wastes may have elevated levels of nutrients, organic matter, and chlorine but should be diluted rapidly to undetectable levels within tens to hundreds of meters of the source. Minimal impacts on water quality are anticipated from these discharges in accordance with NPDES permit requirements.

Deck drainage includes all effluents resulting from rain, deck washings, and runoff from curbs, gutters, and drains, including drip pans in work areas. Rainwater that falls on the uncontaminated areas of the Independence Hub will flow overboard without treatment.

However, rainwater that falls on the deck and other areas such as chemical storage areas and places where equipment is exposed will be collected and treated in an oil/water separator to meet NPDES permit requirements. Little or no impact on water quality is anticipated.

Other discharges in accordance with the NPDES permit, such as uncontaminated freshwater or seawater, desalination brine, uncontaminated ballast and bilge water, and miscellaneous discharges are expected to be diluted rapidly and have little or no impact on water quality.

Support Operations. Support vessels will discharge treated sanitary and domestic wastes. These will have a slight effect on water quality in the immediate vicinity of these discharges. Sanitary and domestic wastes may have elevated levels of nutrients, organic matter, and chlorine but should be diluted rapidly to undetectable levels within tens to hundreds of meters of the source. Minimal impacts on water quality are anticipated from these discharges in accordance with USCG requirements.

(b) Accidents

A spill in offshore waters would produce a slick on the water and temporarily increase hydrocarbon concentrations. The OSRA modeling indicates no contacts with shorelines within 3 days after a spill and a very small probability of contacting any shoreline within 10 days. During this time, it is assumed that most or all of the spill volume would be removed due to spill weathering and response measures. Therefore, no significant impacts on coastal water quality would be likely.

A small chemical spill could produce short-term, localized impacts on water quality. Depending upon the chemical spilled and its solubility in seawater, chemicals will either be diluted, dissolved, or remain insoluble and disperse once they reach the sea surface or come in contact with seawater. The consequence of a spill of any of the chemicals in the chemical inventory would be dependent on the type and volume of chemicals released. A short-term, localized reduction in water quality might be expected.

B.1.6 Fisheries

The main commercial fishing activity in deep waters of the northern Gulf of Mexico is pelagic longlining for tuna, swordfish, and other billfishes (Continental Shelf Associates, Inc., 2002). Pelagic longlining has occurred historically in the project area, primarily during spring and summer.

Longline gear consists of monofilament line that is deployed from a moving vessel and generally allowed to drift for 4 to 5 hours (Continental Shelf Associates, Inc., 2002). As the mainline is put out, baited leaders and buoys are clipped in place at regular intervals. It takes 8 to 10 hours to deploy a 70-km longline and about the same time to retrieve it. Longlines are often set near oceanographic features such as fronts or downwellings, with the aid of sophisticated on-board temperature sensors, depth finders, and positioning equipment. Vessels are 10 to 30 m long, and their trips last from about 1 to 3 weeks. The main homeports for longlining vessels are Dulac and Venice, Louisiana; and Destin, Madeira Beach, and Panama City, Florida.

It is unlikely that any commercial fishing activity other than longlining is occurring at or near the project area. Benthic species targeted by commercial fishers occur on the upper continental slope, well inshore of the project area. Royal red shrimp are caught by trawlers in water depths of about 250 to 550 m. Tilefish are caught by bottom longlining in water depths from about 165 to 450 m (Continental Shelf Associates, Inc., 2002).

Most recreational fishing activity in the northeastern Gulf occurs in depths less than about 200 m (Continental Shelf Associates, Inc., 1997, 2002). In deeper water, the main attraction is petroleum platforms. Due to the distance from shore and the relatively small number of offshore structures, it is unlikely that any recreational fishing activity is occurring in the project area.

(a) Routine Operations

Hub presence is the only IPF that may have an impact on commercial fishing activity. There is a slight possibility of pelagic longlines becoming entangled with an offshore structure. For example, in January 1999, a portion of a pelagic longline snagged on the acoustic Doppler current profiler of a dynamically positioned drillship working in the Gulf of Mexico (Continental Shelf Associates, Inc., 2002). The line was removed without incident. Generally, longline fishers use radar and are aware of offshore structures and ships when placing their sets. Therefore, little or no impact on pelagic longlining is expected.

As it is unlikely that any recreational fishing activity is occurring in the project area, no adverse impacts are anticipated. A minor beneficial impact is possible if recreational fishers are attracted to the Independence Hub.

Other factors such as effluent discharges are likely to have negligible impacts on commercial or recreational fisheries due to rapid dispersion, the small area of ocean affected, and the intermittent nature of the discharges.

(b) Accidents

Pelagic longlining activities could be temporarily disrupted in the event of a large spill in the project area. The area affected would be relatively small, and the duration presumably would be a few days, based on the anticipated weathering characteristics and spill response capabilities.

It is unlikely that any recreational fishing activity is occurring in the project area due to the distance from shore. Due to spill weathering and response measures, no disruption of commercial or recreational fishing activities in coastal waters would be expected.

B.1.7 Marine Mammals

(a) Routine Operations

Routine IPFs potentially affecting marine mammals include

- Hub presence (noise and lights);
- Marine trash and debris; and
- Support operations.

Other factors such as effluent discharges are likely to have negligible impacts on marine mammals due to rapid dispersion, the small area of ocean affected, and the intermittent nature of the discharges.

The only endangered marine mammal potentially present at the project area is the sperm whale. The project area is near a region where sperm whales are frequently sighted, in the Mississippi Canyon area (Davis et al., 2000). The most common nonendangered cetaceans in the deepwater environment are odontocetes such as pantropical spotted dolphin, spinner dolphin, and clymene dolphin. Other odontocetes that may be present include dwarf and pygmy sperm whales, four species of beaked whales, and several other species of dolphins and porpoises (MMS, 2002, 2004).

The Florida manatee is a coastal species that does not occur in the project area. Manatees sometimes occur in Louisiana coastal waters (where the shore base is located) during summer months, and vessel strikes are a major cause of manatee mortality in peninsular Florida, where most of the manatee population is located. Florida manatees are not likely to be adversely affected by oil and gas activities in the area (U.S. Fish and Wildlife Service [USFWS], 2001). Routine activities are not expected to have any impacts on manatees, and they are not discussed further.

Hub Presence (noise and lights). Sperm whales may or may not avoid the project area. Noise associated with OCS activities is of relatively low frequency, typically between 4.5 to 30 Hz (Richardson et al., 1995). The sperm whale appears to have good low frequency hearing, but the available data do not indicate a consistent response to anthropogenic noise (National Marine Fisheries Service [NMFS], 2002). Sperm whales have been known to stop echolocating or vocalizing when disturbed by certain low frequency sounds. Noise associated with drilling is relatively weak in intensity, and individual sperm whales' noise exposure would be transient. There is already considerable offshore oil and gas activity in nearby regions of the central Gulf, including drilling and production operations, support vessel and helicopter activity, and seismic surveys.

Other cetaceans may or may not avoid the project area due to noise. Most odontocetes have their best hearing in high frequencies and are less likely to be disturbed by low frequency noise. Noise associated with drilling is also relatively weak in intensity, and marine mammals' exposure to these sounds would be transient.

Marine Trash and Debris. Ingestion of, or entanglement with, accidentally discarded debris can kill or injure marine mammals. The disposal of solid waste from drilling rigs and vessels is prohibited by the MMS and the USCG under MARPOL regulations. In addition, MMS has issued NTL 2003-G11, which instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires posting of placards at prominent locations on offshore vessels and structures, and requires a marine trash and debris awareness training and certification process. Compliance with this NTL and any related MMS requirements is assumed to be effective in minimizing the potential for debris-related impacts on marine mammals.

Support Operations. Vessel and helicopter traffic may startle or disturb marine mammals. Reactions may range from apparent indifference to evasive moves (e.g., turns, diving, etc.). Many of the reactions of marine mammals to vessel traffic appear to be primarily a result of noise, though there may be visual or other cues as well.

There is a small risk of a supply or crew boat striking a sperm whale. There have been reports of sperm whales deaths attributed to striking the propeller of a vessel (NMFS, 2002). Sperm whales are found within oceanic waters and are therefore more likely to encounter vessels traveling at high speeds, both during daylight and nighttime hours. Although sperm whales are capable of avoiding these vessels, it is possible that collisions may occur under certain circumstances. For example, sperm whales periodically spend extended periods of time (up to 30 minutes) to restore oxygen levels within their tissues after deep dives. The most likely impact on sperm whales would be vessel avoidance rather than collision.

To reduce the potential for vessel strikes, the MMS has issued NTL 2003-G10, which recommends protected species identification training, specifies ways for vessel operators and crews to avoid vessel strikes, and requires operators to report sightings of any injured or dead protected species. Compliance with this NTL and any related MMS requirements is assumed to be effective in minimizing the likelihood of vessel strikes.

(b) Accidents

Sperm Whale (endangered species). The sperm whale is the only endangered marine mammal likely to be affected by an oil spill at the project area. Sperm whales are widely distributed in the Gulf of Mexico, but concentrations occur in the Mississippi Canyon area south of the Mississippi River Delta (Davis et al., 2000). Though the areas of sperm whale concentrations are relatively small, it is possible that a spill could reach areas frequented by sperm whales prior to weathering. The total area of a slick is expected to be small relative to the available deepwater habitat. Oil exposure would not persist in the open ocean, and the animals could avoid oiled areas. Although a spill could contact sperm whales, primarily sublethal effects are expected due to avoidance and natural dispersion/weathering of the spill in the offshore environment (MMS, 2002, 2004).

Florida Manatee (endangered species). The Florida manatee occasionally occurs in coastal waters of Louisiana, Mississippi, Alabama, and the Florida Panhandle during summer months. OSRA modeling indicates no contacts with shorelines within 3 days and a very small probability of contacting any shoreline within 10 days after a spill at the project area. During this time, natural weathering processes and spill response measures as described in the Sub-Regional OSRP are assumed to remove most or all of the spilled oil, preventing significant impacts to manatees or their habitat. In addition, the number of manatees potentially present along this coast is a small fraction of the population in peninsular Florida, and the population is not likely to be adversely affected by offshore oil and gas activities, including an oil spill (USFWS, 2001).

Other Marine Mammals. The most common nonendangered cetaceans in the deepwater environment are pantropical spotted dolphin, spinner dolphin, and clymene dolphin. Other species that may be present include dwarf and pygmy sperm whales, four species of beaked whales, and 14 species of dolphins and porpoises. The total area affected by a spill is expected to be small relative to the available deepwater habitat. Although a spill could contact marine mammals, primarily sublethal effects are expected due to avoidance and natural dispersion/weathering of the spill in the offshore environment (MMS, 2002).

B.1.8 Sea Turtles

Five species of endangered or threatened sea turtles may be found near the project area. Endangered species are the leatherback (*Dermochelys coriacea*), Kemp's ridley (*Lepidochelys kempii*), and hawksbill (*Eretmochelys imbricata*) sea turtles. The loggerhead sea turtle (*Caretta caretta*) is a threatened species. The green sea turtle (*Chelonia mydas*) is listed as threatened, except for the Florida breeding population, which is listed as endangered.

Leatherbacks and loggerheads are the most likely turtles to be present as adults near the project area. Leatherbacks are the most pelagic of the sea turtles and were frequently sighted on the continental slope during GulfCet II aerial surveys (Mullin and Hoggard, 2000). Leatherbacks were sighted on the continental slope in the northeastern Gulf during summer months, but not during winter. Although loggerheads were more abundant in shallower water, they were also sighted in deepwater areas during winter (Mullin and Hoggard, 2000). Green, hawksbill, and Kemp's ridley turtles are typically inshore species that are unlikely to occur near the project area as adults. Hatchlings or juveniles of any of the sea turtles may be present in deepwater areas, where they may be associated with sargassum and other flotsam.

Sea turtle nesting in the northeastern Gulf of Mexico can be summarized as follows:

- Loggerhead turtles nest in significant numbers along the Florida Panhandle and to a lesser extent in Alabama, Mississippi, and Louisiana. Loggerheads account for over 99 percent of turtle nests on northwest Florida beaches, with their nesting season extending from 1 May through 31 October (MMS, 2002).
- Green turtles infrequently nest on Florida Panhandle and Alabama beaches, generally between 1 May and 30 September (Meylan et al., 1995; Alabama Game and Fish Division, 1997).
- Leatherback turtles occasionally nest on Florida Panhandle beaches from 1 May through 31 October (MMS, 2002).
- Hawksbill and Kemp's ridley turtles do not nest anywhere near the project area.

(a) Routine Operations

Routine IPFs potentially affecting sea turtles include

- Hub presence (noise and lights);
- Marine trash and debris; and
- Support operations (service vessels and helicopters).

Other factors such as effluent discharges are likely to have negligible impacts on sea turtles due to rapid dispersion, the small area of ocean affected, and the intermittent nature of the discharges.

Hub Presence (noise and lights). Offshore drilling activities produce a broad array of sounds at frequencies and intensities that may be detected by sea turtles (Geraci and St. Aubin, 1987). Potential impacts may include behavioral disruption and temporary or permanent displacement from the area near the sound source. Certain sea turtles, especially loggerheads, may be attracted to offshore structures and thus may be more susceptible to impacts from sounds produced during routine operations.

Helicopters and service vessels may also affect sea turtles due to machinery noise and/or visual disturbances. The most likely impacts would be short-term behavioral changes such as diving and evasive swimming, disruption of activities, or departure from the area.

Turtle hatchlings may be attracted to brightly lit offshore platforms, where they may be subject to increased predation by birds and fishes that are also attracted to offshore structures. However, NMFS (2002) indicates that attraction to offshore platforms is unlikely to appreciably reduce the reproduction, numbers, or distribution of sea turtles in the wild.

Marine Trash and Debris. Ingestion of, or entanglement with, accidentally discarded solid debris can kill or injure sea turtles (Lutcavage et al., 1997). Some adult sea turtles such as loggerheads and leatherbacks may ingest plastic debris. The disposal of solid waste from drilling rigs and vessels is prohibited. Also, MMS has issued NTL 2003-G11, which instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires posting of placards at prominent locations on offshore vessels and structures, and requires a marine trash and debris awareness training and certification process. Compliance with this NTL and any related MMS requirements is assumed to be effective in minimizing the potential for debris-related impacts on sea turtles.

Support Operations (service vessels and helicopters). There is a chance of collision between service vessels and sea turtles. While adult turtles are visible at the surface during the day and in clear weather, they can be difficult to spot from a moving vessel when resting below the water surface or during nighttime or periods of inclement weather. To reduce the potential for vessel strikes, the MMS has issued NTL 2003-G10, which recommends protected species identification training, specifies ways for vessel operators and crews to avoid vessel strikes, and requires operators to report sightings of any injured or dead protected species. Compliance with this NTL and any related MMS requirements is assumed to be effective in minimizing the likelihood of striking sea turtles.

(b) Accidents

Any of the five species of sea turtles could be affected by a spill in offshore waters. However, the turtles most likely to be affected would be leatherbacks and loggerheads, the most common adult turtles in offshore waters. Leatherbacks and loggerheads are regularly sighted within deepwater areas over the continental slope. In addition, juvenile turtles are regularly found within convergence zones in deepwater areas. The total area of a slick is expected to be small relative to the available deepwater habitat. Although turtle numbers within the deepwater Gulf are small when compared to the continental shelf, it is possible that individuals may come into contact with a spill. It is possible that some individuals may not recover from such exposure. However, primarily sublethal effects are expected (MMS, 2002, 2004).

The OSRA modeling indicates no contacts with any shorelines within 3 days, no contacts with Florida Panhandle turtle nesting beaches within 10 days, and a very small probability of contacting any shoreline within 10 days. During this time, it is assumed that most or all of the spill volume would be removed due to weathering and response measures. Therefore, no significant impacts on turtle nesting beaches would be expected.

B.1.9 Air Quality

There are no site-specific air quality data for the project area. The attainment status of Federal OCS waters is unclassified because there is no provision for classification in the Clean Air Act for waters outside of State waters (MMS, 2002). Due to the distance from shore-based pollution sources, offshore air quality is expected to be good.

All coastal counties and parishes in Louisiana, Mississippi, Alabama, and Florida are considered to be in attainment of the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and suspended particulate matter (PM_{10}). Five Louisiana parishes (Ascension, Iberville, East Baton Rouge, West Baton Rouge, and Livingston) are nonattainment areas for ozone (O_3).

The Breton National Wilderness Area, which is part of the Breton National Wildlife Refuge (NWR) is designated under the Clean Air Act as a Prevention of Significant Deterioration Class I air quality area. This area is protected by stringent air quality standards administered by the USFWS. Mitigating measures, including low sulfur diesel fuels and stricter air emissions monitoring and reporting requirements, are required for sources that are within 100 km of the Breton Class I area and that exceed emissions levels agreed upon by the administering agencies. The project area is beyond the 100-km radius from Breton Island, and therefore no special requirements apply.

(a) Routine Operations

Routine IPFs potentially affecting air quality include

- Air emissions (from pipeline and Hub installation, as well as Hub operations); and
- Support operations (service vessels and helicopters).

Routine offshore air pollutant emissions will result from both the Hub production operations, and helicopters and service vessels. These emissions occur mainly from combustion or burning of fuels and natural gas and from venting or evaporation of hydrocarbons. The combustion of fuels occurs primarily on diesel-powered generators, pumps, or motors and from lighter fuel motors. Primary air pollutants associated with OCS activities are nitrogen oxides, CO, sulfur oxides, volatile organic compounds (VOCs), and PM_{10}.

Due to the distance from shore, routine operations in the project area will have no impact on air quality conditions along the coast, including the Florida Panhandle. ***DOCD Appendix G*** provides the Projected Air Quality Emissions Report prepared in accordance with NTL 2003-G17. Annual exemption levels are set by the MMS based on the distance from shore. As shown in **Table 3**, the projected annual emissions are below the exemption levels, and therefore no further analysis is required.

(b) Accidents

A large spill would affect air quality in the vicinity of the oil slick by introducing VOCs through evaporation. The emissions would not last long due to rapid volatilization of hydrocarbons. Evaporation is greatest within the first few days (MMS, 2002). The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time.

Table 3. Summary of air emissions calculations.

Year	Emitted Substance (tons)				
	Particulate Matter	Sulfur Oxides	Nitrogen Oxides	Volatile Organic Compounds	Carbon Monoxide
2006	40.33	185.00	1,386.23	41.59	302.45
2007	1.42	7.00	769.92	7.08	473.49
2008	1.85	9.11	1,023.98	9.39	630.39
2009	1.85	9.11	1,023.98	9.39	630.39
2010	1.85	9.11	1,023.98	9.39	630.39
2011	1.85	9.11	1,023.98	9.39	630.39
2012	1.85	9.11	1,023.98	9.39	630.39
2013	1.85	9.11	1,023.98	9.39	630.39
2014	1.85	9.11	1,023.98	9.39	630.39
2015	1.85	9.11	1,023.98	9.39	630.39
Allowable	2,997.00	2,997.00	2,997.00	2,997.00	68,282.16

The OSRA modeling indicates no contacts with shorelines within 3 days after a spill, when most of the evaporation occurs. Therefore, little or no impact on air quality in coastal or onshore areas would be expected.

A small chemical spill could also produce short-term, localized impacts on air quality (for example, if chemical dust or VOCs were released). The consequence of a spill of any of the chemicals in the chemical inventory would be dependent on the type and volume of chemicals released. A short-term, localized reduction in air quality might be expected following a spill of volatile materials.

B.1.10 Shipwreck Sites (known or potential)

(a) Routine Operations

There are no IPFs associated with routine operations that are likely to cause impacts to shipwreck sites. The leases are not on the MMS list of blocks determined to have a high probability of archaeological resources. Therefore, no impacts are expected.

(b) Accidents

The OSRA modeling indicates no contacts with coastal waters or shorelines within 3 days and a very small probability of contacting any shoreline within 10 days after a spill. Based on spill weathering characteristics and planned response measures, it is considered highly unlikely that a large oil spill in the project area would reach coastal areas or very shallow waters where shipwreck sites might become contaminated with oil.

B.1.11 Prehistoric Archaeological Sites

(a) Routine Operations

There are no IPFs that are likely to cause impacts to prehistoric archaeological sites. The leases are not on the MMS list of blocks determined to have a high probability of archaeological resources. Therefore, no impacts are expected.

(b) Accidents

The OSRA modeling indicates no contacts with coastal waters or shorelines within 3 days and a very small probability of contacting any shoreline within 10 days after a spill. Based on the anticipated spill weathering characteristics and planned response measures, it is considered highly unlikely that a spill in the project area would reach coastal areas or very shallow waters where prehistoric sites could become contaminated with oil.

B.2 VICINITY OF OFFSHORE LOCATION

B.2.1 Essential Fish Habitat

Most fishery species in the Gulf of Mexico are managed by the Gulf of Mexico Fishery Management Council (GMFMC). This council has prepared fishery management plans (FMPs) identifying EFH for corals and coral reefs, shrimp, stone crab, spiny lobster, reef fishes, coastal pelagic fishes, and red drum, none of which occur within the deeper waters overlying the lease area.

Another group of exploited species, the highly migratory pelagic fishes, are managed by NMFS. In its FMP for Atlantic tunas, swordfish, and sharks that inhabit the Gulf of Mexico, NMFS (1999) addressed EFH for managed highly migratory species. These include 10 sharks, 3 tunas, and 1 swordfish species of concern. These migratory species may occur as transients in the project area. EFH includes most of the substrate and water column of the Gulf of Mexico where the managed species commonly occur. Although billfishes (sailfish [*Istiophorus platypterus*], blue marlin [*Makaira nigricans*], white marlin [*Tetrapterus albidus*], and longbill spearfish [*T. pfluegeri*]) are now managed as highly migratory species, there were no EFH designations in NMFS (1999).

Spatially limited EFH called habitat areas of particular concern (HAPCs) have also been identified in the Gulf of Mexico by the GMFMC. These include Dry Tortugas (Fort Jefferson National Monument), Florida Keys National Marine Sanctuary, Florida Middle Grounds, and Flower Garden Banks National Marine Sanctuary. While no HAPCs are located near the Atwater Valley blocks, migratory species that use these HAPCs may migrate through the Atwater Valley area.

While the project area *per se* is not recognized as an important or critical area for breeding or migrations, the presence of the Loop Current (normally located to the south of the project area) and its role as a migratory pathway for highly migratory pelagic fish species suggest that migrants may be rare but present intermittently. Deepwater habitats, including those of the project area, may provide spawning areas for pelagic fishes such as king and Spanish mackerels and others.

(a) Routine Operations

Routine IPFs potentially affecting EFH include

- Hub presence; and
- Effluent discharges.

Hub Presence. The Independence Hub will act as a fish attracting device (FAD). In oceanic waters, the FAD effect would be most pronounced for epipelagic fishes such as tunas, dolphin, billfishes, and jacks, which are commonly attracted to fixed and drifting

surface structures (e.g., Holland et al., 1990; Higashi, 1994; Relini et al., 1994). This FAD effect would possibly enhance feeding of epipelagic predators by attracting and concentrating smaller fish species.

Effluent Discharges. Other effluent discharges affecting EFH via diminution in ambient water quality include sanitary and domestic wastes, deck drainage, uncontaminated freshwater or seawater, desalination brine, uncontaminated ballast and bilge water, and miscellaneous discharges. Impacts on water quality have been discussed previously. No significant impacts on EFH are expected from these discharges.

(b) Accidents

A major spill in offshore waters would produce a slick on the water and temporarily increase hydrocarbon concentrations. Given that EFH includes most of the substrate and water column of the Gulf of Mexico where highly migratory managed species commonly occur, some impact on EFH would be unavoidable. However, the area affected would be a very small percentage of the EFH in the Gulf of Mexico, and the duration would be brief (few hours to a few days).

A large spill could affect water column biota including phytoplankton, zooplankton, and nekton. While adult and juvenile fishes may actively avoid a large oil spill, the planktonic eggs and larvae would be unable to avoid contact. Eggs and larvae of fishes will die if exposed to certain toxic fractions of spilled oil. Most of the fishes inhabiting shelf or oceanic waters of the Gulf of Mexico have planktonic eggs and larvae. Impacts would be potentially greater if local scale currents retained planktonic larval assemblages (and the floating oil slick) within the same water mass. However, due to the wide dispersal of early life history stages of fishes in the surface waters of the Gulf of Mexico, a spill is not expected to have significant impacts at the population level.

A blowout resulting in a condensate spill could affect benthic communities within a few hundred meters of the wellsite. The impacts are discussed under Benthic Communities. The spill could affect a relatively small area of soft bottom seafloor, which would be recolonized by benthic organisms over a period of months to years. Neither chemosynthetic nor live bottom communities are found in the lease blocks. Therefore, a major spill is unlikely to have any impacts on EFH for demersal fishes.

The project area is not recognized as an important or critical area for breeding or migrations. However, the Loop Current, which is generally located south of the project area but sometimes overlaps it, serves as a migratory pathway for bluefin tuna and other migratory pelagic fishes as they move between the Gulf of Mexico and adjacent waters. Migratory species that migrate through the Atwater Valley area following a spill could be exposed briefly to the spill. In open ocean waters, especially those near the Loop Current, it is expected that a spill would be naturally dispersed and weathered rapidly. Due to the limited area affected by a deepwater spill and the rapid dissolution and evaporation of the slick, no significant impacts on breeding habitats or migration routes would be expected.

B.2.2 Marine and Pelagic Birds

A variety of seabirds may occur in the pelagic environment of the project areas (Clapp et al., 1982a,b, 1983; Peake, 1996; Hess and Ribic, 2000). Seabirds spend much of their

lives offshore over the open ocean, except during breeding season when they nest along the coast. In addition, other birds such as waterfowl, marsh birds, and shorebirds may occasionally be present over open ocean areas. No endangered or threatened bird species are likely to occur at the project area due to the distance from shore. For a discussion of Shore Birds and Coastal Nesting Birds, see **EIA Section B.3.3**.

Seabirds of the northeastern Gulf of Mexico were surveyed from ships during the GulfCet II program. Hess and Ribic (2000) reported that terns, storm-petrels, shearwaters, and jaegers were the most frequently sighted seabirds in the deepwater area (>200 m). Relationships with hydrographic features were found for several species, possibly due to effects of hydrography on nutrient levels and productivity of surface waters where birds forage. GulfCet II did not estimate bird densities; however, Powers (1987) indicates that seabird densities over the open ocean typically are <10 birds/km^2.

(a) Routine Operations

Routine IPFs potentially affecting marine and pelagic birds include

- Hub presence; and
- Marine trash and debris.

Other factors such as effluent discharges are likely to have negligible impacts on marine birds due to rapid dispersion, the small area of ocean affected, and the intermittent nature of the discharges.

Hub Presence. Pelagic seabirds and trans-Gulf migrant birds may be present at the project area. Birds may use offshore drilling rigs and platforms for resting, feeding, or as temporary shelter from inclement weather (Russell, 2001). Some birds may be attracted to offshore structures because of the lights and the fish populations that aggregate around these structures. Birds that frequent platforms may be exposed to contaminants including air pollutants and routine discharges, but significant impacts are unlikely due to rapid dispersion. Birds migrating over water at night have been known to strike offshore structures, resulting in death or injury (Wiese et al., 2001).

Marine Trash and Debris. Debris lost overboard from offshore operations can injure or kill birds that ingest or become entangled in it. MMS regulations and Federal law prohibit disposal of trash and debris in the ocean. In addition, MMS has issued NTL 2003-G11, which instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires posting of placards at prominent locations on offshore vessels and structures, and requires a marine trash and debris awareness training and certification process. Compliance with this NTL and any related MMS requirements is assumed to be effective in minimizing the potential for debris-related impacts on birds.

(b) Accidents

Pelagic seabirds could be exposed to oil from a spill at the project area. Hess and Ribic (2000) reported that terns, storm-petrels, shearwaters, and jaegers were the most frequently sighted seabirds in the deepwater Gulf of Mexico (>200 m). Powers (1987) indicates that seabird densities over the open ocean typically are <10 birds/km^2, and therefore total numbers of birds potentially affected by a spill would be small.

Spilled oil may affect birds through various pathways. Direct contact with oil may result in the fouling or matting of feathers with subsequent limitation or loss of flight capability, or insulating or water repellent capabilities; irritation or inflammation of skin or sensitive tissues such as eyes and other mucous membranes; or toxic effects from ingested oil or the inhalation of oil or related volatile distillates. The Central Gulf multisale EIS discusses these impacts (MMS, 2002).

B.2.3 Public Health and Safety

(a) Routine Operations

There are no IPFs associated with routine operations that are expected to affect public health and safety.

(b) Accidents

An H_2S release was not considered as an IPF because MMS determined AT 305 and 349 to be "H_2S absent" by letter dated 21 October 2002. No impacts on public health and safety are expected from an H_2S release.

In the event of a major spill from a tank rupture or blowout, the main safety and health concerns are those of the offshore personnel responding to such a spill. The proposed activities will be covered by the Sub-Regional OSRP, and in addition, the Independence Hub will maintain a Shipboard Oil Pollution Emergency Plan as required under MARPOL 73/78. Anadarko will use the best and safest technologies throughout the project, including spill response efforts. Based on the WCD discharge volumes, anticipated weathering characteristics, and response measures as detailed in the Sub-Regional OSRP, it is expected that most or all of the spill would be removed before reaching coastal waters or shorelines. Therefore, no impacts on the health and safety of the general public are expected.

B.3 COASTAL AND ONSHORE

Coastal habitats in the northeastern Gulf of Mexico that may be affected by oil and gas activities are described in the Central Gulf multisale EIS (MMS, 2002) and in a literature review by Collard and Way (1997). Sensitive coastal habitats are also tabulated in Anadarko's Sub-Regional OSRP. Coastal habitats inshore of the project area include barrier beaches and dunes, wetlands, and submerged seagrass beds. Generally, most of the northeastern Gulf is fringed by barrier beaches, with wetlands and/or submerged seagrass beds occurring in sheltered areas behind the barrier islands and in estuaries.

B.3.1 Beaches

(a) Routine Operations

There are no IPFs associated with routine activities that could affect beaches due to the distance from shore (over 100 miles).

(b) Accidents

The OSRA modeling indicates no contacts with any shorelines within 3 days after a spill (see **Table 2**). In addition, there is a very small probability of contacting any shoreline within 10 days. During this time, most or all of the spill volume is assumed to be

removed due to spill weathering and response measures. Therefore, no significant impacts on beaches are expected.

B.3.2 Wetlands

(a) Routine Operations

Coastal wetlands are unlikely to be affected by a routine IPF due to the distance from shore (over 100 miles). Support operations including crew boats and supply boats may have a minor incremental impact on coastal wetlands. Over time with a large number of vessel trips, vessel wakes can erode shorelines along inlets, channels, and harbors. This is particularly of concern in coastal Louisiana because of the existing high rate of coastal wetland loss. Impacts are assumed to be minimized by following the speed and wake restrictions in harbors and channels.

(b) Accidents

The OSRA modeling indicates no contacts with shorelines within 3 days after a spill and a very small probability of contacting any shoreline within 10 days. During this time, most or all of the spill volume is assumed to be removed due to spill weathering and response measures. Therefore, no significant impacts on wetlands are expected.

B.3.3 Shore Birds and Coastal Nesting Birds

The following bird species of concern are found in inshore waters or onshore areas:

- Brown pelican;
- Piping plover;
- Southeastern snowy plover; and
- Bald eagle.

Two other endangered species are mentioned in the Central Gulf multisale EIS (MMS, 2002) but do not warrant further discussion: (1) the least tern, for which the endangered designation applies only to interior populations; and (2) the whooping crane, which is not likely to be present inshore of the project area (they winter at Aransas National Wildlife Refuge, Texas).

Brown Pelican. The eastern brown pelican (*Pelecanus occidentalis*) inhabits coastal habitats and forages within coastal waters and waters of the inner continental shelf. Aerial and shipboard surveys including GulfCet and GulfCet II indicate that brown pelicans do not occur in deep, offshore waters (Fritts and Reynolds, 1981; Peake, 1996; Hess and Ribic, 2000). Subsequent to the ban of DDT pesticide, this species has successfully recolonized much of its former range. It has been de-listed from its endangered status in Alabama and Florida, though still listed as endangered in Louisiana and Mississippi (USFWS, 2002). Brown pelicans are listed by Florida as a species of special concern.

Piping Plover. The piping plover (*Charadrius melodus*) is a migratory shorebird that overwinters along the southeastern U.S. and Gulf of Mexico coasts. Piping plovers inhabit coastal sandy beaches and mudflats. This species is currently in decline and listed as threatened as a result of historic hunting pressure, and habitat loss and degradation (Ehrlich et al., 1992). Critical habitat has been proposed, including coastal areas in Florida, Alabama, Mississippi, and Louisiana.

Southeastern Snowy Plover. The southeastern snowy plover (*Charadrius alexandrinus tenuirostris*) is a shorebird that nests within Gulf of Mexico coastal habitats such as dry sandy beaches and flats. Though not Federally listed as endangered or threatened (USFWS, 2002), it is listed as threatened by the State of Florida due to population declines resulting from habitat loss and degradation (Ehrlich et al., 1992). Nesting sites in the Florida Panhandle range from the Alabama border eastward beyond Little St. George.

Bald Eagle. The southern bald eagle (*Haliaeetus leucocephalus*) is a terrestrial raptor that is widely distributed across the southern U.S., including coastal habitats along the Gulf of Mexico. The Gulf coast is inhabited by both wintering migrant and resident bald eagles (Johnsgard, 1990; Ehrlich et al., 1992). Populations of southern bald eagles have increased in recent years as a result of the ban of DDT pesticide and the efforts of intense recovery programs. Populations in the lower 48 states are classified as threatened, but the USFWS has proposed to de-list the species in the lower 48 states (USFWS, 2002).

(a) Routine Operations

Due to the distance from shore, the only routine IPF that may affect shore birds and coastal nesting birds is support operations. Support vessels and helicopters will transit coastal areas in Louisiana where species such as the brown pelican, piping plover, snowy plover, and bald eagle may be found. Helicopter and vessel traffic could periodically disturb individuals or groups of birds within sensitive coastal habitats (e.g., wetlands that may support feeding, resting, or breeding birds). However, Federal Aviation Administration guidelines and corporate helicopter policies specify that pilots maintain a minimum altitude of 213 m (700 ft) while in transit offshore, 305 m (1,000 ft) over unpopulated areas or across coastlines, and 610 m (2,000 ft) over populated areas and sensitive habitats such as wildlife refuges and park properties. Vessel operators use designated navigation channels and comply with posted speed and wake restrictions while transiting sensitive inland waterways. With these guidelines in effect, it is likely that individual birds would experience at most only short-term, behavioral disruption.

(b) Accidents

Coastal bird species of concern that could be affected include the brown pelican, piping plover, southeastern snowy plover, and bald eagle. Brown pelicans typically do not venture offshore of the inner continental shelf. Piping plovers and southeastern snowy plovers could encounter the spill only if it reached coastal habitats. A spill would not be expected to contact or otherwise impact bald eagles unless contamination and subsequent cleanup activities occurred within the vicinity of eagle nesting or roosting sites. The OSRA modeling indicates no contacts with any shorelines within 3 days after a spill and a very small probability of contacting any shoreline within 10 days. During this time, it is assumed that most or all of the spill volume would be removed due to spill weathering and response measures. Therefore, no significant impacts on shore birds or coastal nesting birds, including species of concern, are expected.

B.3.4 Coastal Wildlife Refuges

National wildlife refuges along the coast from Cedar Key, Florida through Louisiana include four in Florida (Cedar Keys, Lower Suwannee, St. Marks, and St. Vincent), two in Alabama (Grand Bay and Bon Secour), one in Mississippi (Grand Bay), and three in

Louisiana (Breton, Delta, and Shell Keys). In addition, there are various State wildlife refuges in coastal areas (tabulated in Anadarko's Sub-Regional OSRP).

(a) Routine Operations

Due to the distance from shore, there are no IPFs associated with routine activities that are likely to affect coastal wildlife refuges.

(b) Accidents

Coastal wildlife refuges could be affected only if a major spill occurred and the oil was transported to shore in significant quantities before being weathered by natural processes or dispersed by response measures. The OSRA modeling indicates that no coastal areas would be contacted by oil within 3 days, and there is a very small probability of oil contacting any shoreline within 10 days. During this time, most or all of the spill would be removed due to natural weathering processes and spill response measures as described in the Sub-Regional OSRP. Therefore, no significant impacts on coastal wildlife refuges or other protected areas are expected.

B.3.5 Wilderness Areas

Wilderness areas and other protected coastal areas in Louisiana, Mississippi, Alabama, and the Florida Panhandle include a national seashore, numerous Wildlife Management Areas and State Parks, aquatic preserves, and other managed areas. There is also an Audubon Bird Sanctuary on the eastern end of Dauphin Island, Alabama. These areas include habitats such as barrier beach and dune systems, wetlands, and submerged seagrass beds that support wildlife including endangered or threatened species.

(a) Routine Operations

Due to the distance from shore, there are no IPFs associated with routine activities that are likely to affect wilderness areas.

(b) Accidents

Wilderness areas and other protected areas in Louisiana, Mississippi, Alabama, and the Florida Panhandle could be affected only if a major spill occurred and the oil was transported to shore in significant quantities before being weathered by natural processes or dispersed by response measures. The OSRA modeling indicates no shoreline contacts within 3 days and a very small probability of contacting any shoreline within 10 days. During this time, most or all of the spill would be removed due to spill weathering and response measures as described in the OSRP. Therefore, no significant impacts on coastal wilderness areas are expected.

B.4 OTHER RESOURCES

B.4.1 Benthic Communities

The seafloor within the lease blocks is expected to consist of soft sediments. Water depth ranges from 2,560 to 2,667 m (8,400 to 8,750 ft) in AT 305 and from 2,636 to 2,697 m (8,650 to 8,850 ft) in AT 349. These depths would place the project area within the Mesoabyssal Zone for both megafauna and macroinfauna, as defined by Gallaway (1988). In terms of megafauna, the fish assemblage is characterized as depauperate, consisting of five species including *Dicrolene kanazawai* and *Basozetus normalis*

(Pequegnat et al., 1990). Macroinfaunal densities reported by Gallaway (1988) for these depths are about 500 to 1,000 individuals/m^2. There are no individual dominant species in the deep-sea macroinfauna, but polychaetes are the most abundant and diverse group.

Meiofauna (animals passing through a 0.5-mm sieve but retained on a 0.062-mm sieve) and microbiota are also important components of the deep-sea benthos. Rowe (2000) indicates little information is available on either group for the deep Gulf. Meiofaunal densities and biomass in the depths of the project area are higher than those of the macroinfauna (Gallaway, 1988). Available data suggest that bacteria are the most important biotic component in terms of biomass, and much of the organic carbon supplying the benthos with energy cycles through the bacteria (Cruz-Kaegi, 1998).

A deep Gulf of Mexico benthos program has expanded on the depth and geographic coverage of the previous continental slope study (Rowe and Kennicutt, 2002). The study includes stations at depths from 300 m to over 3,000 m. Preliminary data from nearby station MT6 indicate macrofaunal densities of about 2,000 individuals/m^2.

(a) Routine Operations

The most important IPFs on deepwater benthic communities are physical disturbances of the seafloor. The seafloor in AT 305 and 349 will be disturbed by the installation of subsea production facilities, including lease-term pipelines and umbilicals, a manifold, and subsea wellheads. A dynamically positioned lay barge would be used to install pipelines using the J-lay method, and therefore there would be no anchoring. In MC 920, a small area of seafloor would be disturbed by the 12 suction pilings used to moor the Independence Hub. It is assumed that the total area of seafloor disturbance will be a few hectares.

These physical disturbances may result in crushing of benthic fauna, burial or disruption of fauna, and increased turbidity from sediment resuspension. Disturbed bottom sediments will be recolonized through larval settlement and migration from adjacent areas. Because some deep-sea biota grow and reproduce slowly, recovery may require several years.

Pursuant to NTL No. 2003-G03, operators may be required to conduct remotely operated vehicle (ROV) surveys during pre-spudding and post-drilling operations for the purpose of biological and physical observations. If required by the MMS, Anadarko will conduct an ROV survey as specified under this NTL. ROV surveys provide information about the extent of impacts on deepwater benthic communities.

(b) Accidents

A blowout resulting in a condensate spill could affect benthic communities within a few hundred meters of the wellsite. While some oil could initially adhere to surface sediments surrounding the wellsite, resulting in smothering and/or toxicity to benthic organisms, most of the oil is assumed to rise rapidly through the water column. The physical impacts of a subsurface blowout are also a consideration. The MMS (2002) estimates that a severe subsurface blowout could resuspend and disperse sediments within a 300-m radius. While coarse sediments (sands) would probably settle at a rapid rate within 400 m from the blowout site, fine sediments (silts and clays) could be resuspended for more than 30 days and dispersed over a much wider area. Surface sediments at the project area are assumed to be largely silt and clay, based on previous

studies (Gallaway, 1988). The affected area would be recolonized by benthic organisms over a period of months to years.

Neither chemosynthetic nor live bottom communities are found in the lease blocks. It is possible that undiscovered chemosynthetic communities exist in other deepwater lease blocks, and live bottom areas are known to be present on the Mississippi-Alabama shelf and shelf edge. However, a spill at the sea surface is unlikely to reach the seafloor. Therefore, a major spill is unlikely to have any impacts on sensitive benthic habitats.

A chemical spill at the surface would be unlikely to affect benthic communities unless heavy or solid materials (e.g., pieces of copper or lead) were lost overboard and sank rapidly to the bottom. Material accumulating on the seabed could kill or injure a few benthic organisms, or alter the sediment quality in a small area that would most likely already be disturbed by previous cuttings and drilling fluid releases. Impacts on benthic communities would be minor to negligible.

B.4.2 Pelagic Communities

(a) Routine Operations

Routine IPFs potentially affecting pelagic communities include

- Hub presence; and
- Effluent discharges.

Hub Presence. The Independence Hub will act as an FAD. In oceanic waters, the FAD effect would be most pronounced for epipelagic fishes such as tunas, dolphin, billfishes, and jacks, which are commonly attracted to fixed and drifting surface structures (e.g., Holland et al., 1990; Higashi, 1994; Relini et al., 1994). This FAD effect would possibly enhance feeding of epipelagic predators by attracting and concentrating smaller fish species.

Effluent Discharges. Produced water discharges have some characteristics that could adversely affect pelagic biota, including low dissolved oxygen and high levels of suspended solids, salinity, organic carbon, and certain metals and organic compounds (Neff, 1987). However, these discharges are expected to disperse and dilute to background levels within about 1,000 m of the discharge point, with no significant biological impacts (MMS, 2002).

Sanitary and domestic wastes may have a slight effect on the pelagic environment in the immediate vicinity of these discharges. Sanitary and domestic wastes may have elevated levels of nutrients, organic matter, and chlorine, but should be diluted rapidly to undetectable levels within tens to hundreds of meters of the source. Minimal impacts on water quality, plankton, and nekton are anticipated.

Deck drainage may have a slight effect on the pelagic environment in the immediate vicinity of these discharges. Deck drainage from contaminated areas will be passed through an oil-water separator prior to release, and discharges will be monitored for visible sheen. The discharges may have slightly elevated levels of hydrocarbons but should be diluted rapidly to undetectable levels within tens to hundreds of meters of the source. Minimal impacts on water quality, plankton, and nekton are anticipated.

Other discharges in accordance with the NPDES permit, such as uncontaminated freshwater or seawater, desalination brine, uncontaminated ballast and bilge water, and miscellaneous discharges are expected to be diluted rapidly and have little or no impact on water column biota.

(b) Accidents

A large spill could affect water column biota including phytoplankton, zooplankton, and nekton. While adult and juvenile fishes may actively avoid a large oil spill, the planktonic eggs and larvae would be unable to avoid contact. Eggs and larvae of fishes will die if exposed to certain toxic fractions of spilled oil. Most of the fishes inhabiting shelf or oceanic waters of the Gulf of Mexico have planktonic eggs and larvae (Richards et al., 1989, 1993). Impacts would be potentially greater if local scale currents retained planktonic larval assemblages (and the floating oil slick) within the same water mass. However, due to the wide dispersal of early life history stages of fishes in the surface waters of the Gulf of Mexico, a spill is not expected to have significant impacts at the population level.

The inventory of chemicals on board for the exploratory drilling program is predominantly formulations with low environmental hazards to the marine environment, and quantities transported are relatively small, hence a chemical spill will have lower environmental implications compared to a large oil spill. Any chemical spill reaching the sea surface has the potential to interact with marine organisms in the immediate vicinity of the spill. Phytoplankton, zooplankton, and nekton may potentially encounter spilled chemicals; however, rapid dilution, dissolution, or dispersal via wind and wave action will temper such impacts. Impacts on pelagic communities would be negligible.

B.4.3 Gulf Sturgeon

The gulf sturgeon (*Acipenser oxyrinchus desotoi*) is the only listed threatened fish species in the Gulf of Mexico. An anadromous fish that migrates from the sea upstream into coastal rivers to spawn in freshwater, it historically ranged from the Mississippi River to Charlotte Harbor, Florida (Wakeford, 2001). Today, this range has contracted to encompass major rivers and inner shelf waters from the Mississippi River to the Suwannee River, Florida. Populations have been depleted or even extirpated throughout this range by fishing, shoreline development, dam construction, water quality changes, and other factors (Barkuloo, 1988; Wakeford, 2001). These declines prompted the listing of the gulf sturgeon as a threatened species in 1991. The best known populations occur in the Apalachicola and Suwannee Rivers in Florida (Carr, 1996; Sulak and Clugston, 1998), the Choctawhatchee in Alabama (Fox et al., 2000), and the Pearl in Mississippi/Louisiana (Morrow et al., 1998).

Adult gulf sturgeon spend March through October in the rivers and November through February in estuarine or shelf waters. The offshore distribution of gulf sturgeon during winter months is not known, but there have been no reported catches in Federal OCS waters (MMS, 2002).

In 2003, critical habitat for the gulf sturgeon was designated in Louisiana, Mississippi, Alabama, and Florida. Critical habitat identifies specific areas that are essential to the conservation of gulf sturgeon and that may require special management considerations or protections. Fourteen geographic areas among the Gulf of Mexico rivers and tributaries

were designated critical habitat. The areas extend from Lake Borgne in Louisiana to Suwannee Sound in Florida (MMS, 2004).

(a) Routine Operations

There are no IPFs associated with routine project activities that are likely to affect gulf sturgeon.

(b) Accidents

Presumably, gulf sturgeon could be affected if oil reached very shallow waters or coastal rivers. However, the OSRA modeling indicates no contacts with coastal waters within 3 days after a spill and a very small probability of any shoreline contact within 10 days. During this time, it is assumed that most or all of the spill volume would be removed due to spill weathering and response measures. Therefore, no significant impacts on gulf sturgeon are expected.

B.4.4 Endangered Beach Mice

Four subspecies of endangered beach mouse occur on barrier islands of Alabama and the Florida Panhandle (MMS, 2002).

(a) Routine Operations

There are no IPFs associated with routine project activities that could affect endangered beach mice due to the distance from shore and the lack of any onshore support activities near any area inhabited by these species.

(b) Accidents

The OSRA modeling indicates no contacts with shorelines inhabited by beach mice within 10 days after a spill. By this time, it is assumed that all of the spill volume would be removed due to spill weathering and response measures. Therefore, no significant impacts on beach mice are expected.

B.4.5 Economic and Demographic Conditions

(a) Routine Operations

The project involves offshore operations with support from existing shore base facilities in Louisiana. Due to the low level of activity and the small number of personnel involved, the project will have a negligible impact on economic and demographic conditions including local employment, and local population centers and industry. No new employees are expected to move permanently into the area.

(b) Accidents

Response to a spill would involve existing resources and personnel, and therefore it would not be expected to have any impact on employment, local population centers, or industry. The OSRA modeling indicates no contacts with shorelines within 3 days after a spill and a very small probability of contacting any shorelines within 10 days after a spill. During this time, all of the spill volume would be removed due to spill weathering and response measures. Therefore, no direct or indirect impacts on economic conditions due to oiling of waters or shorelines, cleanup activities, etc. would be expected.

B.4.6 Land Use

(a) Routine Operations

The project will use existing onshore support facilities in coastal Louisiana. The existing land use is industrial. The project will not involve any new construction or changes to existing land use, and therefore will not have any impacts. Levels of boat and helicopter traffic, as well as demand for goods and services including scarce coastal resources, will represent a very small fraction of the overall level of activity occurring at the shore base.

(b) Accidents

An offshore spill would not be expected to affect land use.

B.4.7 Recreation and Tourism

(a) Routine Operations

There are no known recreational uses of the lease blocks. Recreational resources and tourism in coastal areas would not be affected by any routine activities due to the distance from shore (over 100 miles). Anadarko will comply with all applicable regulations, NTLs, and lease stipulations regarding solid waste disposal. Waste management practices including waste minimization and recycling programs will minimize the chance of trash or debris being lost overboard and subsequently washing up on beaches.

(b) Accidents

The OSRA modeling indicates no contacts with shorelines within 3 days after a spill and a very small probability of contacting any shorelines within 10 days after a spill. During this time, all of the spill volume would be removed due to spill weathering and response measures. Therefore, no impacts on coastal recreation and tourism would be expected.

C. IMPACTS ON PROPOSED ACTIVITIES

C.1 GEOLOGIC HAZARDS

A shallow hazards report covering AT 305 and 349 was submitted with the Initial Exploration Plan in accordance with NTL 2003-G17, and NTL 98-20. The analysis concluded that the proposed wellsites are free of any major hazards to drilling. A shallow hazard report covering MC 920 is being submitted separately to the MMS. Pipelines will be permitted under separate cover and permitted as individual right-of-way pipeline applications and lease term pipeline applications. The applications will contain individual hazard assessments.

C.2 SEVERE WEATHER

Under most circumstances, weather is not expected to have any effect on the proposed activities. Extreme weather, including high winds, strong currents, and large waves, have been taken into account in the design criteria for the Independence Hub. High winds and

limited visibility during a severe storm could disrupt support activities (vessel and helicopter traffic) and might make it necessary to suspend some activities for safety reasons until the storm or weather event passes. In the event of a hurricane, procedures as outlined in Anadarko's Hurricane Evacuation Plan as well as the rig's Emergency Response Manual for Hurricanes would be adhered to.

C.3 CURRENTS AND WAVES

Under most circumstances, physical oceanographic conditions are not expected to have any effect on the proposed activities. Strong currents and large waves have been taken into account in the design criteria for the Independence Hub. High waves during a severe storm could disrupt support activities (vessel and helicopter traffic) and might make it necessary to suspend some activities for safety reasons until the storm or weather event passes.

D. ALTERNATIVES

In the development of the proposed action, Anadarko has considered various technical and operational options. However, no formal alternatives were analyzed.

E. MITIGATION MEASURES

The proposed action does not involve any mitigation measures other than those required by laws and regulations, including all applicable Federal, State, and local requirements concerning air emissions, discharges to water, and solid waste disposal, as well as any additional permit requirements. All project activities will be conducted under an MMS-approved Sub-Regional OSRP, which has been submitted to the MMS under separate cover.

F. CONSULTATION

No persons or agencies were consulted during the preparation of this EIA.

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APPENDIX I
CZM CONSISTENCY CERTIFICATION

Issues identified in the Louisiana Coastal Zone Management Program include the following: general coastal use guidelines, levees, linear facilities (pipelines); dredged soil deposition; shoreline modifications, surface alterations, hydrologic and sediment transport modifications, waste disposal; uses that result in the alteration of waters draining into coastal waters; oil, gas, or other mineral activities; and air and water quality.

Relevant enforceable policies were considered in certifying consistency for Louisiana.

Issues identified in the Alabama Coastal Zone Management Program include the following: review of all coastal resource uses and activities that have a direct and significant effect on the coastal area. Uses subject to the Alabama CZM Program are divided into regulated and non-regulated categories. Regulated uses are those that have a direct and significant impact on the coastal areas. These uses require a State permit or are required by Federal law to be consistent with the management program. Uses that require a State permit must receive a certificate of compliance. Non-regulated uses are those activities that have a direct and significant impact on the coastal areas but do not require a State permit or Federal consistency certification. Non-regulated uses must be consistent with the ACAMP and require local permits to be administered by ADEM.

CZM Consistency Certifications for Louisiana and Alabama are enclosed as **Attachment I-1**.

ALABAMA COASTAL ZONE MANAGEMENT
CONSISTENCY CERTIFICATION
Atwater Valley Blocks 305 and 349

The OCS related oil and gas development activities having potential impact on the Alabama Coastal Zone are based on the location of the proposed facilities, access to those sites, best practical techniques for operations and production equipment, guidelines for the prevention of adverse environmental effects, effective environmental protection, emergency plans and contingency plans. Alabama policies have been addressed below or are cross referenced to the appropriate sections of the plan:

Topic	Cross Reference	Comments
Coastal Resource Use Policies		
Coastal Development		Dock and port facilities in LA will be used. There will be no new construction, dredging, or filling in Alabama state waters. There will be no new commercial development or capital improvements in Alabama's coastal zone, nor will there be any employment effects.
Mineral Resource Exploration and Extraction		Proposed operations will take place 180 miles from Alabama's coastline.
Commercial Fishing	Appendix H	
Hazard Management	Appendix C	A Shallow Hazards Report has been prepared and submitted to MMS in order to identify and assess the seafloor and shallow geologic conditions in this block(s).
Shoreline Erosion	Appendix H	Proposed operations will take place 180 miles from Alabama's coastline.
Recreation	Appendix H	
Transportation	Appendix B	
Natural Resource Protection Policies		
Biological Productivity	Appendix H	
Water Quality	Appendix H	
Water Resources	Appendix H	
Air Quality	Appendix G	
Wetlands and Submerged Grassbeds	Appendix H	
Beach and Dune Protection	Appendix H	
Wildlife Habitat Protection	Appendix H	

Endangered Species	Appendix H	
Cultural Resources Protection	Appendix D	This block does not lie within a high probability zone for historic shipwrecks, and thus does not require an archaeological report. As part of the Hazards Report, it was determined that no man-made facilities nor seafloor obstructions were located in this block(s)

The proposed activities described in detail in the Plan comply with Alabama's approved Coastal Management Program(s) and will be conducted in a manner consistent with such Program(s).

Anadarko Petroleum Corporation

Judy Davidson
Staff Regulatory Analyst

Date: May 4, 2005

COASTAL ZONE MANAGEMENT

CONSISTENCY CERTIFICATION

INITIAL DEVELOPMENT OPERATIONS COORDINATION DOCUMENT ATWATER VALLEY BLOCKS 305 AND 349

The proposed activities described in detail in this OCS Plan comply with Louisiana's approved Coastal Zone Management Program(s) and will be conducted in a manner consistent with such Program(s).

Anadarko Petroleum Corporation

Judy Davidson, Certifying Official

May 4, 2005

U.S. Department of the Interior
Minerals Management Service

OCS PLAN INFORMATION FORM

OMB Control Number: 1010-0049
OMB Approval Expires: August 31, 2006

General Information

Type of OCS Plan:	Exploration Plan (EP)	X	Development Operations Coordination Document (DOCD)
Company Name:	Anadarko Petroleum Corporation	MMS Operator Number:	00981
Address:	1201 Lake Robbins Drive	Contact Person:	Judy Davidson
	The Woodlands, TX 77380	Phone Number:	(832) 636-8766
		E-Mail Address:	judy_davidson@anadarko.com

Lease(s): G-18566 / G-18557			Area: AT and MC			Block(s): 305 / 349 and 920		Project Name (If Applicable): Jubilee / Independence Hub	
Objective(s):		Oil	X	Gas		Sulphur		Salt	Onshore Base: Fourchon, LA	Distance to Closest Land (Miles): 110 / 90

Description of Proposed Activities (Mark all that apply)

	Exploration drilling		Development drilling
	Well completion	X	Installation of production platform
	Well test flaring (for more than 48 hours)	X	Installation of production facilities
	Installation of caisson or platform as well protection structure		Installation of satellite structure
X	Installation of subsea wellheads and/or manifolds	X	Commence production
X	Installation of lease term pipelines		Other (Specify and describe)

Have you submitted or do you plan to submit a Conservation Information Document to accompany this plan?	X	Yes		No
Do you propose to use new or unusual technology to conduct your activities	X	Yes		No
Do you propose any facility that will serve as a host facility for deepwater subsea development?	X	Yes		No
Do you propose any activities that may disturb an MMS-designated high-probability archaeological area?		Yes	X	No
Have all of the surface locations of your proposed activities been previously reviewed and approved by MMS?	X	Yes		No

Tentative Schedule of Proposed Activities

Proposed Activity	Start Date	End Date	No. of Days
Install lease-term pipelines	04-01-2006	04-20-2006	20
Install Independence Hub	04-01-2006	05-15-2006	55
Place 5 wells on production	07-01-2007	06-30-2022	

Description of Drilling Rig

	Jackup		Drillship
	Gorilla Jackup		Platform rig
	Semisubmersible		Submersible
	DP Semisubmersible		Other (Attach Description)
Drilling Rig Name (If Known):			

Description of Production Platform

	Caisson		Tension leg platform
	Well protector		Compliant tower
	Fixed platform		Guyed tower
	Subsea manifold	X	Floating production system
	Spar		Other (Attach Description)

Description of Lease Term Pipelines

From (Facility/Area/Block)	To (Facility/Area/Block)	Diameter (Inches)	Length (Feet)
SS Manifold AT 349	10" ROW Pipeline AT 349	8"	80'
SS Manifold AT 349	8" ROW Pipeline AT 349	8"	80'
AT 349 #003	SS Manifold AT 349	6"	80'
AT 349 #004	SS Manifold AT 349	6"	80'
AT 349 #002	SS Manifold AT 349	6"	80'
AT 305 #001	SS Manifold AT 349	8"	2,800'
AT 305 #002	SS Manifold AT 349	8"	12,500'

Public Information

OCS PLAN INFORMATION FORM

Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name):	Subsea Completion			
Platform A "Independence Hub"				
Anchor Radius (if applicable) in feet: NA		Yes	X	No

	Surface Location	Bottom-Hole Location (For Wells)
Lease No.:	OCS unleased RUE requested	OCS NA
Area Name	MC	
Block No.:	920	
Blockline Departures (in feet)	N/S Departure: 7920 F N L	N/S Departure: F ____ L
	E/W Departure: 7920 F E L	E/W Departure: F ____ L
Lambert X-Y coordinates	X: 1,322,640	X:
	Y: 10,193,040	Y:
Latitude/ Longitude	Latitude 28.085056	Latitude
	Longitude 87.985839	Longitude
	TVD (Feet): NA	MD (Feet): NA
		Water Depth (Feet): 7900

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
1	MC	876	X = 1,321,786	Y = 10,203,052	800'
2	MC	876	X = 1,322,656	Y = 10,203,082	800'
3	MC	876	X = 1,323,525	Y = 10,203,038	800'
4	MC	921	X = 1,332,638	Y = 10,193,925	800'
5	MC	921	X = 1,332,682	Y = 10,193,056	800'
6	MC	921	X = 1,332,652	Y = 10,192,186	800'
7	MC	964	X = 1,323,494	Y = 10,183,028	800'
8	MC	964	X = 1,322,624	Y = 10,182,998	800'
9	MC	964	X = 1,321,755	Y = 10,183,042	800'
10	MC	919	X = 1,312,642	Y = 10,192,155	800'
11	MC	919	X = 1,312,598	Y = 10,193,024	800'
12	MC	919	X = 1,312,628	Y = 10,193,894	800'

Paperwork Reduction Act of 1995 Statement: The Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35) requires us to inform you that MMS collects this information as part of an applicant's Exploration Plan or Development Operations Coordination Document submitted for MMS approval. We use the information to facilitate our review and data entry for OCS plans. We will protect proprietary data according to the Freedom of Information Act and 30 CFR 250.196. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid Office of Management and Budget Control Number. The use of this form is voluntary. The public reporting burden for this form is included in the burden for preparing Exploration Plans and Development Operations Coordination Documents. We estimate that burden to average 580 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to the Information Collection Clearance Officer, Mail Stop 4230, Minerals Management Service, 1849 C Street, N.W., Washington, DC 20240.

Public Information

OCS PLAN INFORMATION FORM

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Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): Well 1 (IEP Location A)	Subsea Completion			
Anchor Radius (if applicable) in feet: NA	X	Yes		No

	Surface Location	Bottom-Hole Location (For Wells)
Lease No.	OCS G-18566	OCS G-18566
Area Name	AT	AT
Block No.	305	305
Blockline Departures (in feet)	N/S Departure: 890 F S L	N/S Departure: F L
	E/W Departure: 7268 F E L	E/W Departure: F L
Lambert X-Y coordinates	X: 1,339,130	X:
	Y: 10,043,450	Y:
Latitude/ Longitude	Latitude 27.673845	Latitude
	Longitude 87.931160	Longitude

TVD (Feet) : 17,780	MD (Feet):	Water Depth (Feet): 8,637

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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Public Information

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Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name):	Subsea Completion			
Well 2 (REP Location B)				
Anchor Radius (if applicable) in feet: NA	X	Yes		No

	Surface Location	Bottom-Hole Location (For Wells)
Lease No.:	OCS G-18566	OCS G-18566
Area Name	AT	AT
Block No.:	305	305
Blockline Departures (in feet)	N/S Departure: 6323 F N L	N/S Departure: F ____ L
	E/W Departure: 3647 F W L	E/W Departure: F ____ L
Lambert X-Y coordinates	X: 1,334,207	X:
	Y: 10,052,077	Y:
Latitude/ Longitude	Latitude 27.697478	Latitude
	Longitude 87.946578	Longitude
	TVD (Feet) : 18,600	MD (Feet): Water Depth (Feet): 8,439

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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Public Information

OCS PLAN INFORMATION FORM

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Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name):	Subsea Completion			
Well 2 (REP Location D)				
Anchor Radius (if applicable) in feet: NA	X	Yes		No

	Surface Location	Bottom-Hole Location (For Wells)
Lease No.	OCS G-18557	OCS G-18857
Area Name	AT	AT
Block No.	349	349
Blockline Departures (in feet)	N/S Departure: 2967 F N L	N/S Departure: F ____ L
	E/W Departure: 6575 F E L	E/W Departure: F ____ L
Lambert X-Y coordinates	X: 1,339,825	X:
	Y: 10,039,593	Y:
Latitude/ Longitude	Latitude 27.663244	Latitude
	Longitude 87.928924	Longitude

TVD (Feet) : 17,850	MD (Feet):	Water Depth (Feet): 8,748

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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Public Information

OCS PLAN INFORMATION FORM

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Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name):	Subsea Completion			
Well 3 (REP Location E)				
Anchor Radius (if applicable) in feet: NA	X	Yes		No

	Surface Location	Bottom-Hole Location (For Wells)
Lease No.	OCS G-18557	OCS G-18557
Area Name	AT	AT
Block No.	349	349
Blockline Departures (in feet)	N/S Departure: 1998 F N L	N/S Departure: F ____ L
	E/W Departure: 173 F E L	E/W Departure: F ____ L
Lambert X-Y coordinates	X: 1,346,227	X:
	Y: 10,040,562	Y:
Latitude/ Longitude	Latitude 27.666044	Latitude
	Longitude 87.909164	Longitude

TVD (Feet) : 18,000	MD (Feet):	Water Depth (Feet): 8,814

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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Public Information

OCS PLAN INFORMATION FORM

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Proposed Well/Structure Location					
Well or Structure Name/Number (If renaming well or structure, reference previous name): Vell 4 (REP Location C)			Subsea Completion		
Anchor Radius (if applicable) in feet: NA			X	Yes	No

	Surface Location	Bottom-Hole Location (For Wells)
Lease No.	OCS G-18557	OCS G-18557
Area Name	AT	AT
Block No.	349	349
Blockline Departures (in feet)	N/S Departure: 3844 F N L	N/S Departure: F ___ L
	E/W Departure: 1101 F E L	E/W Departure: F ___ L
Lambert X-Y coordinates	X: 1,345,300	X:
	Y: 10,038,716	Y:
Latitude/ Longitude	Latitude 27.660947	Latitude
	Longitude 87.911989	Longitude
	TVD (Feet) : 18,500	MD (Feet): Water Depth (Feet): 8,854

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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Public Information